IN THE CLAIMS

CLAIM 1 (Currently Amended) A superconducting apparatus comprising: a composition having a transition temperature greater than or equal to 26°K, the composition ~~including a rare earth or rare earth-like element, a transition metal element~~ capable of exhibiting multivalent states ~~and oxygen, including~~ comprising at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, a ~~means~~ temperature controller ~~for~~ capable of maintaining said composition at said temperature to exhibit said superconductivity and ~~mean~~ a current source ~~for~~ capable of passing an electrical superconducting current through said composition while exhibiting said superconductivity , and said composition comprising a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 2 (Previously Presented) The superconducting apparatus of claim 1, further including an alkaline earth element substituted for at least one atom of said rare earth or rare earth-like element in said composition.

CLAIM 3 (Previously Presented) The superconducting apparatus of claim 2, where said transition metal is Cu.

CLAIM 4 (Previously Presented) The superconducting apparatus of claim 3, where said alkaline earth element is selected from the group consisting of B, Ca, Ba, and Sr.

CLAIM 5 (Previously Presented) The superconducting apparatus of claim 1, where said transition metal element is selected from the group consisting of Cu, Ni, and Cr.

CLAIM 6 (Previously Presented) The superconducting apparatus of claim 2, where said rare earth or rare earth-like element is selected from the group consisting of La, Nd, and Ce.

CLAIM 7 (Previously Presented) The superconducting apparatus of claim 1, where said phase is crystalline with a perovskite-like structure.

CLAIM 8 (Previously Presented) The superconducting apparatus of claim 2, where said phase is crystalline with a perovskite-like structure.

CLAIM 9 (Previously Presented) The superconducting apparatus of claim 1, where said phase exhibits a layer-like crystalline structure.

CLAIM 10 (Previously Presented) The superconducting apparatus of claim 1, where said phase is a mixed copper oxide phase.

CLAIM 11 (Previously Presented) The superconducting apparatus of claim 1, where said composition is comprised of mixed oxides with alkaline earth doping.

CLAIM 12 (Currently Amended) A superconducting combination, comprising: a superconductive oxide having a transition temperature greater than or equal to 26°K,

~~means~~ a current source ~~for~~ capable of passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said transition temperature, ~~and~~

~~cooling means~~ a temperature controller ~~for~~ capable of cooling said composition to a superconducting state at a temperature greater than or equal to 26°K, and;

said superconducting oxide comprises a transition metal and at least one element selected from the group consisting of a first element group, a second element group and

combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements

CLAIM 13 (Currently Amended) The combination of claim 12, where said superconductive ~~composition includes a transition metal~~ oxide comprises a layered structure.

CLAIM 14 (Currently Amended) The combination of claim 12, where said superconductive ~~composition~~ oxide ~~includes~~ comprises Cu-oxide.

CLAIM 15 (Currently Amended) The combination of claim 12, where said superconductive ~~composition includes~~ oxide comprises a multivalent transition metal, ~~oxygen, and at least one additional element~~.

CLAIM 16 (Original) The combination of claim 15, where said transition metal is Cu.

CLAIM 17 (Currently Amended) The combination of claim 15, where said ~~additional element is a rare earth or rare earth-like element~~ superconductive oxide comprises a layered structure.

CLAIM 18 (Currently Amended) The combination of claim 15, where said ~~additional element is an alkaline earth element~~ superconductive oxide comprises a multiphase material comprising a superconductive phase.

CLAIM 19 (Currently Amended) The combination of claim 12, where said ~~composition includes~~ superconductive oxide comprises a perovskite-like superconducting phase.

CLAIM 20 (Currently Amended) The combination of claim 12, where said ~~composition~~ includes superconductive oxide comprises a substituted transition metal oxide.

CLAIM 21 (Currently Amended) The combination of claim 20, where said substituted transition metal oxide ~~includes~~ comprises a multivalent transition metal element.

CLAIM 22 (Original) The combination of claim 20, where said substituted transition metal oxide is an oxide of copper.

CLAIM 23 (Original) The combination of claim 20, where said substituted transition metal oxide has a layer-like structure.

CLAIM 24 (Currently Amended) An apparatus comprising:

a transition metal oxide having a phase therein which exhibits a superconducting state at a critical temperature greater than or equal to of 26°K,

~~means~~ a temperature controller ~~for~~ capable of lowering the temperature of said material at least to said critical temperature to produce said superconducting state in said phase, ~~and~~

~~means~~ a current source ~~for~~ capable of passing an electrical superconducting current through said transition metal oxide while it is in said superconducting state, and;

said transition metal oxide comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements

CLAIM 25 (Previously Presented) The apparatus of claim 24, where said transition metal oxide is comprised of a transition metal capable of exhibiting multivalent states.

CLAIM 26 (Previously Presented) The apparatus of claim 24, where said transition metal oxide is comprised of a Cu oxide.

CLAIM 27 (Currently Amended) A superconducting apparatus comprising: a composition having a transition temperature greater than or equal to 26°K, said composition being a substituted ~~Cu-oxide including~~ transition metal oxide comprising a superconducting phase having a structure which is structurally substantially similar to the orthorhombic-tetragonal phase of said composition, ~~means~~ a temperature controller ~~for~~ capable of maintaining said composition at a temperature greater than or equal to said transition temperature to put said composition in a superconducting state; and ~~means~~ a current source ~~for~~ capable of passing current through said composition while in said superconducting state., said transition metal oxide comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements

CLAIM 28 (Currently Amended) ~~The~~ A superconducting apparatus ~~of claim 27~~, comprising: a composition having a transition temperature greater than or equal to 26°K, said composition being a substituted Cu-oxide including a superconducting phase having a structure which is structurally substantially similar to the orthorhombic-tetragonal phase of said composition, ~~means~~ a temperature controller capable of maintaining said composition at a temperature greater than or equal to said transition temperature to put said composition in a superconducting state; and ~~means~~ a current source capable of passing current through said composition while in said superconducting state.
wherein said substituted Cu-oxide includes a rare earth or rare earth-like element.

CLAIM 29 (Currently Amended) ~~The~~ A superconducting apparatus ~~of claim 27~~, comprising: a composition having a transition temperature greater than or equal to 26°K, said composition being a substituted Cu-oxide including a superconducting phase

having a structure which is structurally substantially similar to the orthorhombic-tetragonal phase of said composition, ~~means~~ a temperature controller capable of maintaining said composition at a temperature greater than or equal to said transition temperature to put said composition in a superconducting state; and ~~means~~ a current source capable of passing current through said composition while in said superconducting state, wherein said substituted Cu-oxide includes an alkaline earth element.

CLAIM 30 (Previously Presented) The superconducting apparatus of claim 29, where said alkaline earth element is atomically large with respect to Cu.

CLAIM 31 (Previously Presented) The superconducting apparatus of claim 27, where said composition has a crystalline structure which enhances electron-phonon interactions to produce superconductivity at a temperature greater than or equal to 26°K.

CLAIM 32 (Previously Presented) The superconducting apparatus of claim 31, where said crystalline structure is layer-like, enhancing the number of Jahn-Teller polarons in said composition.

CLAIM 33 (Currently Amended) A superconducting apparatus comprising: a an element comprising a composition capable of carrying a superconductive current flowing therein having a superconducting onset temperature greater than or equal to 26°K, the composition being comprised of a copper oxide doped with an alkaline earth element where the concentration of said alkaline earth element is near to the concentration of said alkaline earth element where the superconducting copper oxide phase in said composition undergoes an orthorhombic to tetragonal structural phase transition.

CLAIM 34 (Currently Amended) A superconducting apparatus comprising: a composition having a superconducting onset temperature greater than or equal to 26°K, ~~a~~ composition being comprised of a mixed copper oxide doped with an element chosen

to result in Cu^{3+} ions in said composition and a ~~means~~ current source ~~for~~ capable of passing a superconducting current through said superconducting composition, and said composition comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 35 (Currently Amended) ~~The~~ A superconducting appraratus ~~of claim 34~~ comprising: an element comprising a superconducting onset temperature greater than or equal to 26°K, a composition being comprised of a mixed copper oxide doped with an element chosen to result in Cu^{3+} ions in said composition and a current source ~~for~~ capable of passing a superconducting current through said superconducting composition wherein said doping element includes an alkaline earth element.

CLAIM 36 (Currently Amended) A combination comprising:

a composition having a superconducting onset temperature greater than or equal to 26°K, said composition being comprised of a substituted ~~copper~~ transition metal oxide exhibiting mixed valence states and at least one other element in its crystalline structure,

~~means~~ a current source ~~for~~ capable of passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said superconducting onset temperature, ~~and~~

~~cooling means~~ a temperature controller ~~for~~ capable of cooling said composition to a superconducting state at a temperature greater than or equal to 26°K, and

said at least one other element comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof.

wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 37 (Currently Amended) A combination comprising:

a composition having a superconducting onset temperature greater than or equal to 26°K, said composition comprising a substituted copper oxide exhibiting mixed valence states and at least one other element in its crystalline structure,

a current source capable of passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said superconducting onset temperature,

a temperature controller capable of cooling said composition to a superconducting state at a temperature greater than or equal to 26°K., and

~~The combination of claim 36,~~ wherein said at least one other element is an alkaline earth element.

CLAIM 38 (Currently Amended) The combination of claim 36, wherein said composition ~~metal oxide~~ is a copper oxide and said at least one other element is an element which results in Cu^{3+} ions in said composition.

CLAIM 39 (Currently Amended) The combination of claim 36, wherein said composition ~~metal oxide~~ is a copper oxide and said at least one other element is an element chosen to result in the presence of both Cu^{2+} and Cu^{3+} ions in said composition.

CLAIM 40 (Currently Amended) An apparatus comprising: a superconductor exhibiting a superconducting onset at an onset temperature greater than or equal to 26°K, said

superconductor being comprised of at least four elements, none of which is itself superconducting at a temperature greater than or equal to 26°K, ~~means~~ a temperature controller ~~for~~ capable of maintaining said superconductor at an operating temperature in excess of said onset temperature to maintain said superconductor in a superconducting state and ~~means~~ a current source ~~for~~ capable of passing current through said superconductor while in said superconducting state and said superconductor comprising a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 41 (Currently Amended) The apparatus of claim 40, where said ~~elements include a transition metal and oxygen~~ superconductor comprises a layered structure.

CLAIM 42 (Currently Amended) ~~A apparatus~~ An apparatus ~~having~~ comprising: a superconducting onset temperature greater than or equal to 26°K, said superconductor being a doped transition metal oxide, where said transition metal is itself non-superconducting and ~~means~~ a current source ~~for~~ capable of passing a superconducting electric current through said composition said transition metal oxide comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements

CLAIM 43 (Previously Presented) The apparatus of claim 42, where said doped transition metal oxide is multivalent in said superconductor.

CLAIM 44 (Previously Presented) The apparatus of claim 42, further including an element which creates a mixed valent state of said transition metal.

CLAIM 45 (Previously Presented) The apparatus of claim 43, where said transition metal is Cu.

CLAIM 46 (Currently Amended) An apparatus ~~having~~ comprising: a superconductor having a superconducting onset temperature greater than or equal to 26°K, said superconductor being an oxide having multivalent oxidation states and including a metal, said oxide having a crystalline structure which is oxygen deficient and a ~~means~~ a current source ~~for~~ capable of passing a superconducting electric current through said superconductor, said metal being a transition metal, and comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements

CLAIM 47 (Previously Presented) The apparatus of claim 46, where said transition metal is Cu.

CLAIM 48 (Currently Amended) A superconductive apparatus comprising: a superconductive composition comprised of a transition metal oxide having substitutions therein, the amount of said substitutions being sufficient to produce sufficient electron-phonon interactions in said composition that said composition exhibits a superconducting onset at temperatures greater than or equal to 26°K, and a source of current ~~for~~ capable of passing a superconducting electric current through said superconductor, and said superconductive composition comprising a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 49 (Previously Presented) The superconductive apparatus of claim 48, where said transition metal oxide is multivalent in said composition.

CLAIM 50 (Previously Presented) The superconductive apparatus of claim 48, where said transition metal is Cu.

CLAIM 51 (Currently Amended) ~~The superconductive apparatus of claim 48,~~ A superconductive apparatus comprising: a superconductive composition comprised of a transition metal oxide having substitutions therein, the amount of said substitutions being sufficient to produce sufficient electron-phonon interactions in said composition that said composition exhibits a superconducting onset at temperatures greater than or equal to 26°K, and a source of current capable of passing a superconducting electric current through said superconductor, wherein said substitutions include an alkaline earth element.

CLAIM 52 (Currently Amended) ~~The superconductive apparatus of claim 48,~~ A superconductive apparatus comprising: a superconductive composition comprised of a transition metal oxide having substitutions therein, the amount of said substitutions being sufficient to produce sufficient electron-phonon interactions in said composition that said composition exhibits a superconducting onset at temperatures greater than or equal to 26°K, and a source of current capable of passing a superconducting electric current through said superconductor., wherein said substitutions include a rare earth or rare earth-like element.

CLAIM 53 (Currently Amended) A superconductive apparatus ~~comprised of a copper-oxide~~ comprising: an element comprising a composition capable of carrying a superconductive current flowing therein comprising ~~having~~ a layer-like crystalline structure and at least one additional element substituted in said crystalline structure, said structure being oxygen deficient and exhibiting a superconducting onset temperature greater than or equal to 26°K, and said composition comprising a transition metal, oxygen and at least one element selected from the group consisting of a first

element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 54 (Curretnly Amended) The superconductor of claim 53, where said additional element creates a mixed valent state of said ~~copper oxide~~ transition metal in said superconductor.

CLAIM 55 (Currently Amended) A combination, comprising:

a transition metal oxide having an superconducting onset temperature greater than about 26°K and having an oxygen deficiency, said transition metal being non-superconducting at said superconducting onset temperature and said oxide having multivalent states,

~~means~~ a current source ~~for~~ capable of an electrical superconducting current through said oxide while said oxide is at a temperature greater than or equal to 26°K, and

~~cooling means~~ a temperature controller ~~for~~ capable of cooling said oxide in a superconducting state at a temperature greater than or equal to 26°K, and

said transition metal oxide comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 56 (Original) The combination of claim 55, where said transition metal is Cu.

CLAIM 57 (Currently Amended) A combination ~~including~~ comprising:

a superconducting oxide having a superconducting onset temperature greater than or equal to 26°K and containing at least 3 elements which are non-superconducting at said onset temperature,

~~means~~ a current source ~~for~~ capable of a superconducting current through said oxide while said oxide is maintained at a temperature greater than or equal to 26°K, and

~~means~~ a temperature controller ~~for~~ capable of maintaining said oxide in a superconducting state at a temperature greater than or equal to 26°K and less than said superconductive onset temperature, and

said superconducting oxide comprising a transition metal and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 58 (Currently Amended) A combination, ~~comprised of~~ comprising:

a ~~copper~~ transition metal oxide superconductor having a superconductor onset temperature greater than about 26°K including an element which results in a mixed valent state in said oxide, said oxide being crystalline and having a layer-like structure,

~~means~~ a current source ~~for~~ capable of a superconducting current through said ~~copper~~ transition metal oxide while it is maintained at a temperature greater than or equal to 26°K and less than said superconducting onset temperature, ~~and~~

~~means~~ a temperature controller ~~for~~ capable of cooling said ~~copper~~ transition metal oxide to a superconductive state at a temperature greater than or equal to 26°K and less than said superconducting onset temperature, and

said transition metal oxide comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 59 (Currently Amended) A combination, ~~comprised of~~ comprising:

a ceramic-like material having an onset of superconductivity at an onset temperature greater than or equal to 26°K,

~~means~~ a current source ~~for~~ capable of providing a superconducting electrical current through said ceramic-like material while said material is maintained at a temperature greater than or equal to 26°K and less than said onset temperature, ~~and~~

~~means~~ a temperature controller ~~for~~ capable of cooling said superconducting ceramic-like material to a superconductive state at a temperature greater than or equal to 26°K and less than said onset temperature, said material being superconductive at temperatures below said onset temperature and a ceramic at temperatures above said onset temperature, and

said ceramic-like material comprising a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements .

CLAIM 60 (Currently Amended) An apparatus ~~comprised of~~ comprising: a transition metal oxide, and at least one additional element, said superconductor having a distorted

crystalline structure characterized by an oxygen deficiency and exhibiting a superconducting onset temperature greater than or equal to of 26°K, a source of current ~~for~~ capable of passing a superconducting electric current in said transition metal oxide, and a cooling apparatus ~~for~~ capable of maintaining said transition metal oxide below said onset temperature at a temperature greater than or equal to 26°K, and

asid transition metal oxide comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements

CLAIM 61 (Previously Presented) The apparatus of claim 60, where said transition metal is Cu.

CLAIM 62 (Currently Amended) An apparatus ~~comprised of~~ comprising: a transition metal oxide and at least one additional element, said superconductor having a distorted crystalline structure characterized by an oxygen excess and exhibiting a superconducting onset temperature greater than or equal to 26°K, a source of current ~~for~~ capable of passing a superconducting electric current in said transition metal oxide, and a cooling apparatus ~~for~~ capable of maintaining said transition metal oxide below said onset temperature and at a temperature greater than or equal to of 26°K , and

asid transition metal oxide comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements

CLAIM 63 (Previously Presented) The apparatus of claim 62, where said transition metal is Cu.

CLAIM 64 (Currently Amended) A combination, comprising:

a mixed ~~copper~~ transition metal oxide composition having enhanced polaron formation, said composition including an element causing said ~~copper~~ transition metal to have a mixed valent state in said composition, said composition further having a distorted octahedral oxygen environment leading to a T_c greater than or equal to 26°K,

~~means~~ a current source ~~for~~ capable of providing a superconducting current through said composition at temperatures greater than or equal to 26°K and less than said T_c, and

~~cooling means~~ a temperature controller ~~for~~ capable of cooling said composition to a temperature greater than or equal to 26°K and less than said T_c and

asid transition metal oxide comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements

CLAIM 65 (Currently Amended) An apparatus comprising: a composition exhibiting superconductivity at temperatures greater than or equal to 26°K, said composition being a ceramic-like material in the RE-AE-TM-O system, where RE is a rare earth or near rare earth element, AE is an alkaline earth element, TM is a multivalent transition metal element having at least two valence states in said composition, and O is oxygen, the ratio of the amounts of said transition metal in said two valence states being determined by the ratio RE : AE, a source of current ~~for~~ capable of passing a superconducting electric current in said transition metal oxide, and a cooling apparatus ~~for~~ capable of maintaining said transition metal oxide below said onset temperature and at a temperature greater than or equal to 26°K.

CLAIM 66 (Currently Amended) An apparatus comprising: a superconductive composition having a transition temperature greater than or equal to 26°K, the composition including a multivalent transition metal oxide and at least one additional element, said composition having a distorted orthorhombic crystalline structure, a source of current ~~for~~ capable of passing a superconducting electric current in said transition metal oxide, and a cooling apparatus ~~for~~ capable of maintaining said transition metal oxide below said onset temperature and at a temperature greater than or equal to 26°K, and said at least one additional element comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 67 (Previously Presented) The apparatus of claim 66, where said transition metal oxide is a mixed copper oxide.

CLAIM 68 (Currently Amended) ~~The apparatus of claim 67,~~
An apparatus comprising: a superconductive composition having a transition temperature greater than or equal to 26°K, the composition including a multivalent transition metal oxide and at least one additional element, said composition having a distorted orthorhombic crystalline structure, a source of current ~~for~~ capable of passing a superconducting electric current in said transition metal oxide, and a cooling apparatus capable of maintaining said transition metal oxide below said onset temperature and at a temperature greater than or equal to 26°K,wherein said one additional element is an alkaline earth element.

CLAIM 69 (Currently Amended) A superconductive combination, comprising:

a superconducting composition exhibiting a superconducting transition temperature greater than or equal to 26°K, said composition being a transition metal oxide having a distorted orthorhombic crystalline structure, ~~and~~

~~means~~ a current source ~~for~~ capable of passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said superconducting transition temperature, and

said transition metal oxide comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 70 (Original) The combination of claim 69, where said transition metal oxide is a mixed copper oxide.

CLAIM 71 (Currently Amended)
A superconductive combination, comprising:

a superconducting composition exhibiting a superconducting transition temperature greater than or equal to 26°K, said composition being a transition metal oxide having a distorted orthorhombic crystalline structure, and

a current source capable of passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said superconducting transition temperature;

said transition metal oxide is a mixed copper oxide;

~~The combination of claim 70,~~ wherein said mixed copper oxide includes an alkaline earth element.

CLAIM 72 (Original) The combination of claim 71, where said mixed copper oxide further includes a rare earth or rare earth-like element.

CLAIM 73 (Witdrawn, Currently Amended) An apparatus comprising: an element capable of caying a superconductive current comprising comprising a composition of matter comprising a superconducting onset temperature greater than or equal to 26°K, said composition of matter made by a method comprising the steps of:

preparing powders of oxygen-containing compounds of a rare earth or rare earth-like element, an alkaline earth element, and copper,
mixing said compounds and firing said mixture to create a mixed copper oxide composition including said alkaline earth element and said rare earth or rare earth-like element, and

annealing said mixed copper oxide composition at an elevated temperature less than about 950°C in an atmosphere including oxygen to produce a superconducting composition having a mixed copper oxide phase exhibiting a superconducting onset temperature greater than or equal to 26°K, said superconducting composition having a layer-like crystalline structure after said annealing step.

CLAIM 74 (Withdrawn, Currently Amended) The ~~method~~ apparatus of claim 73, where the amount of oxygen incorporated into said composition is adjusted by said annealing step, the amount of oxygen therein affecting the critical temperature T_c of the superconducting composition.

CLAIM 75 (Withdrawn, Currently Amended) An apparatus comprising: an element capable of caying a superconductive current comprising a composition of matter for carrying a superconductive current comprising a superconducting onset temperature greater than or equal to 26°K, said superconductor being comprised of a rare earth or rare earth-like element (RE), an alkaline earth element (AE), copper (CU), and oxygen (O) and having the general formula RE-AE-CU-O, said composition being made by a

method including the steps of combining said rare earth or rare earth-like element, said alkaline earth element and said copper in the presence of oxygen to produce a mixed copper oxide including said rare earth or rare earth-like element and said alkaline earth element therein, and

heating said mixed copper oxide to produce a superconductor having a crystalline layer-like structure and exhibiting a superconducting onset temperature greater than or equal to 26°K the critical transition temperature of said superconductor being dependent on the amount of said alkaline earth element therein.

CLAIM 76 (Withdrawn) The apparatus of claim 75, where said heating step is done in an atmosphere including oxygen.

CLAIM 77 (Currently Amended) A combination, comprising:

a mixed copper oxide composition including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE), said composition having a layer-like crystalline structure and multi-valent oxidation states, said composition exhibiting a substantially zero resistance to the flow of electrical current therethrough when cooled to a superconducting state at a temperature greater than or equal to 26°K, said mixed copper oxide having a superconducting onset temperature greater than or equal to 26°K, and

~~electrical means~~ a current source ~~for~~ capable of passing an electrical superconducting current through said composition when said composition exhibits substantially zero resistance at a temperature greater than or equal to 26°K and less than said onset temperature.

CLAIM 78 (Original) The combination of claim 77, where the ratio (AE,RE) : Cu is substantially 1:1.

CLAIM 79 (Currently Amended) The combination of claim 77, where the ratio (AE,RE) : Cu is substantially [[1:1]] 2:1.

CLAIM 80 (Original) The combination of claim 77, wherein said crystalline structure is perovskite-like.

CLAIM 81 (Original) The combination of claim 77, where said mixed copper oxide composition has a non-stoichiometric amount of oxygen therein.

CLAIM 82 (Withdrawn, Currently Amended) An apparatus comprising: an element capable of carrying a superconductive current ~~superconductor~~ comprising a superconducting onset temperature greater than or equal to 26°K, said superconductor being comprised of a rare earth or rare earth-like element (RE), an alkaline earth element (AE), a transition metal element (TM), and Oxygen (O) and having the general formula RE-AE-TM-O, said superconductor being made by a method including the steps of combining said rare earth or rare earth-like element, said alkaline earth element and said transition metal element in the presence of oxygen to produce a mixed transition metal oxide including said rare earth or rare earth-like element and said alkaline earth element therein, and

heating said mixed transition metal oxide to produce superconductor having a crystalline layer-like structure and exhibiting a superconducting onset temperature greater than or equal to 26°K, said superconductor having a non-stoichiometric amount of oxygen therein.

CLAIM 83 (Witdrawn) The apparatus of claim 82, where said transition metal is copper.

CLAIM 84 (Currently Amended) A superconducting combination, comprising:

a mixed transition metal oxide composition containing a non-stoichiometric amount of oxygen therein, a transition metal and at least one additional element, said composition

having substantially zero resistance to the flow of electricity therethrough when cooled to a superconducting state at a temperature greater than or equal to 26°K, said mixed transition metal oxide has a superconducting onset temperature greater than or equal to 26°K, and

~~electrical means~~ current source ~~for~~ capable of passing an electrical superconducting current through said composition when said composition is in said superconducting state at a temperature greater than or equal to 26°K, and less than said superconducting onset temperature , and

said mixed transition metal oxide comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 85 (Original) The combination of claim 84, where said transition metal is copper.

CLAIM 86 (Currently Amended) An apparatus comprising:

a composition including a transition metal, a rare earth or rare earth-like element, an alkaline earth element, and oxygen, where said composition is a mixed transition metal oxide having a non-stoichiometric amount of oxygen therein and exhibiting a superconducting onset temperature greater than or equal to 26°K,

~~means~~ a temperature controller ~~for~~ capable of maintaining said composition to said superconducting state at a temperature greater than or equal to 26°K and less than said superconducting onset temperature, and

~~means~~ a current source for capable of passing an electrical current through said composition while said composition is in said superconducting state.

CLAIM 87 (Allowed) The apparatus of claim 86, where said transition metal is copper.

CLAIM 88 (Currently Amended) An apparatus comprising:

a composition exhibiting a superconductive state at a temperature greater than or equal to 26°K,

a cooler ~~for~~ capable of cooling said composition to a temperature greater than or equal to 26°K at which temperature said composition exhibits said superconductive state, and

a current source ~~for~~ capable of passing an electrical current through said composition while said composition is in said superconductive state , and

said composition comprising a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 89 (Currently Amended) The apparatus of claim 88, wherein said ~~composition is comprised of a~~ transition metal ~~oxide~~ is copper.

CLAIM 90 (Currently Amended) The apparatus of claim 88, where said ~~composition is comprised of a~~ transition metal ~~oxide~~ is multivalent.

CLAIM 91 (Currently Amended) A combination, comprising:

a composition exhibiting the onset of a DC substantially zero resistance state at an onset temperature in excess of 30°K, and

~~means~~ a current source ~~for~~ capable of passing an electrical current through said composition while it is in said substantially zero resistance state, and

said composition comprising a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 92 (Previously Presented) The combination of claim 91, where said composition is a copper oxide.

CLAIM 93 (Currently Amended) An apparatus, comprising:

a mixed ~~copper~~ transition metal oxide material exhibiting an onset of superconductivity at an onset temperature greater than or equal to 26°K, and
~~means~~ a current source for producing an electrical current through said copper oxide material while it is in a superconducting state at a temperature greater than or equal to 26°K, and
said transition metal oxide comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 94 (Currrently amended) The apparatus of claim 93, where said ~~copper~~ mixed transition metal oxide material exhibits a layer-like crystalline structure.

CLAIM 95 (Currently Amended) The apparatus of claim 93, where said said ~~copper~~ mixed transition metal oxide material exhibits a mixed valence state.

CLAIM 96 (Currently Amended) A superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition comprising a ~~copper-oxide~~ compound having a layer-type perovskite-like crystal structure, the composition having a superconductor transition temperature T_c of greater than or equal to 26°K;

(b) ~~means~~ a current source ~~for~~ capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; ~~and~~

(c) ~~means~~ a temperature controller ~~for~~ capable of causing an electric current to flow in the superconductor element , and

said superconductive composition comprising a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 97 (Currently Amended) The superconductive apparatus according to claim 96 in which the ~~copper-oxide~~ compound of the superconductive composition ~~includes~~ comprises a copper-oxide and at least one rare-earth or rare-earth-like element and at least one alkaline-earth element.

CLAIM 98 (Previously Presented) The superconductive apparatus according to claim 97 in which the rare-earth or rare-earth-like element is lanthanum.

CLAIM 99 (Previously Presented) The superconductive apparatus according to claim 97 in which the alkaline-earth element is barium.

CLAIM 100 (Currently Amended) The superconductive apparatus according to claim 96 in which the ~~copper-oxide~~ compound of the superconductive composition ~~includes~~ comprises a mixed valent ~~copper~~ transition metal ions.

CLAIM 101 (Currently Amended) The superconductive apparatus according to claim 100 in which the ~~copper-oxide~~ compound ~~includes~~ comprises at least one element in a nonstoichiometric atomic proportion.

CLAIM 102 (Currently Amended) The superconductive apparatus according to claim 101 in which oxygen is present in the ~~copper-oxide~~ compound in a nonstoichiometric atomic proportion.

CLAIM 103 (Currently Amended) A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:
(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound having a layer-type perovskite-like crystal structure, the copper-oxide compound including at least one rare-earth or rare-earth-like element and at least one alkaline-earth element, the composition having a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{q=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) ~~means~~ a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{q=0}$ of the superconductive composition; and

(c) ~~means~~ a current source ~~for~~ capable of causing an electric current to flow in the superconductor element.

CLAIM 104 (Previously Presented) The superconductive apparatus according to claim 103 in which the rare-earth or rare-earth-like element is lanthanum.

CLAIM 105 (Previously Presented) The superconductive apparatus according to claim 103 in which the alkaline-earth element is barium.

CLAIM 106 (Previously Presented) The superconductive apparatus according to claim 103 in which the copper-oxide compound of the superconductive composition includes mixed valent copper ions.

CLAIM 107 (Previously Presented) The superconductive apparatus according to claim 106 in which the copper-oxide compound includes at least one element in a nonstoichiometric atomic proportion.

CLAIM 108 (Previously Presented) The superconductive apparatus according to claim 107 in which oxygen is present in the copper-oxide compound in a nonstoichiometric atomic proportion.

CLAIM 109 (Currently Amended) A superconductive apparatus comprising: a composition having a transition temperature greater than or equal to 26°K, the composition ~~including a rare-earth or alkaline-earth element,~~ comprising a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, ~~means~~ a temperature controller ~~for~~ capable of maintaining said composition at said temperature to exhibit said superconductivity and ~~means~~ a current source ~~for~~ capable of passing an electrical superconducting current through said composition while exhibiting said superconductivity, and the compositon comprising at least one element selected from the group consisting of a first element group, a second element group and

combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements

CLAIM 110 (Currently Amended) The ~~combination~~ superconductive apparatus of claim ~~15~~ 109, where said ~~additional element is rare earth or alkaline earth element~~ composition has a perovskite structure.

CLAIM 111 (Currently Amended) A device comprising: an element capable of carrying a superconductive current comprising a superconducting transition metal oxide having a superconductive onset temperature greater than or equal to 26°K, a temperature controller capable of mantaining said superconducting transition metal oxide ~~being~~ at a temperature less than said superconducting onset temperature ~~and having a superconducting current flowing therein~~ ,said superconductive transition metal oxide comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements

CLAIM 112 (Currently Amended) A device comprising: an element capable of carrying a superconductive current comprising a superconducting ~~copper oxide~~ composition having a superconductive onset temperature greater than or equal to 26°K, a temperature controller capable of mantaining said superconducting ~~copper oxide~~ composition ~~being~~ at a temperature less than said superconducting onset temperature ~~and having a superconducting current flowing therein~~, and said composition comprising a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 113 (Currently Amended) A device comprising: an element capable of carrying a superconductive current comprising a superconducting oxide composition having a superconductive onset temperature greater than or equal to 26°K, a temperature controller capable of mantaining said superconducting copper oxide ~~being~~ at a temperature less than said superconducting onset temperature ~~and having a superconducting current flowing therein~~, said composition comprising at least one each of rare earth, an alkaline earth, and copper.

CLAIM 114 (Currently amended) A device comprising: an element capable of carrying a superconductive current comprising a superconducting oxide composition having a superconductive onset temperature greater than or equal to 26°K, a temperature controller capable of mantaining said superconducting copper oxide ~~being~~ at a temperature less than said superconducting onset temperature ~~and having a superconducting current flowing therein~~, said composition comprising at least one each of a group IIIB element, an alkaline earth, and copper.

CLAIM 115 (Currently Amended) A device comprising: an element capable of carrying a superconductive current comprising a ~~transition metal oxide~~ composition having a T_c greater than or equal to 26°K ~~carrying a superconducting current~~ , a temperature controller capable of mantaining said ~~transition metal oxide~~ composition ~~is maintained~~ at a temperature less than said T_c., and said composition comprising a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 116 (Currently Amended) An apparatus comprising: an element capable of carrying a superconductive current comprising a transition metal oxide composition having a T_c greater than or equal to 26°K ~~carrying a superconducting current current~~ ,

and a temperature controller capable of maintaining said ~~transition metal oxide~~ composition ~~is maintained~~ at a temperature less than said T_c., and said composition comprising a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 117 (Currently Amended) A structure comprising: an element capable of carrying a superconductive current comprising a ~~transition metal oxide~~ composition having a T_c greater than or equal to 26°K ~~carrying a superconducting current~~ and wherein said composition comprising a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 118 (Currently Amended) An apparatus comprising: an element capable of carrying a superconductive current comprising a ~~transition metal oxide~~ composition having a T_c greater than or equal to 26°K ~~carrying a superconducting current~~, and said composition comprising a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 119 (Currently Amended) A device comprising: an element capable of carrying a superconductive current comprising a copper oxide having a T_c greater than or equal to 26°K ~~carrying a superconducting current~~, said copper oxide is capable of being maintained at a temperature less than said T_c and said copper oxide comprising at least one element selected from the group consisting of a first element group, a second

element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements

CLAIM 120 (Currently Amended) An apparatus comprising: an element capable of carrying a superconductive current comprising a copper oxide having a T_c greater than or equal to 26°K ~~carrying a superconducting current~~, a temperature controller capable of maintaining said copper oxide ~~is maintained~~ at a temperature less than said T_c, and said copper oxide comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements

CLAIM 121 (Currently Amended) A device comprising: an element capable of carrying a superconductive current comprising a copper oxide having a T_c greater than or equal to 26°K ~~carrying a superconducting current~~ and said copper oxide comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 122 (Currently Amended) An apparatus comprising: an element capable of carrying a superconductive current comprising a copper oxide having a T_c greater than or equal to 26°K ~~carrying a superconducting current~~ and said copper oxide comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 123 (Currently Amended) A superconductive apparatus comprising:

a composition of the formula $Ba_xLa_{x-5}Cu_5O_Y$ wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K;

a ~~means~~ temperature controller ~~for~~ capable of maintaining the temperature of said composition at a temperature less than
said critical temperature to induce said superconducting state in said metal oxide phase; and

a ~~means~~ current source ~~for~~ capable of passing an electrical current through said composition while said metal oxide phase is in said superconducting state.

CLAIM 124 (Currently Amended) A device comprising: an element capable of carrying a superconductive current comprising a composition of matter having a T_c greater than or equal to 26°K ~~carrying a superconducting current~~, said composition comprising at least one each of a IIIB element, an alkaline earth, and copper oxide and a temperature controller capable of mantaining said ~~device is maintained~~ composition of matter at a temperature less than said T_c.

CLAIM 125 (Currently Amended) An apparatus comprising: an element capable of carrying a superconductive current comprising a composition of matter having a T_c greater than or equal to 26°K ~~carrying a superconducting current~~, said composition comprising at least one each of a rare earth, an alkaline earth, and copper oxide.

CLAIM 126 (Currently Amended) A device comprising: an element capable of carrying a superconductive current comprising a composition of matter having a T_c greater than or equal to 26°K carrying ~~a superconducting current~~, said composition comprising at least one each of a rare earth, and copper oxide.

CLAIM 127 (Currently Amended) A device comprising: an element capable of carrying a superconductive current comprising a composition of matter having a T_c greater than or equal to 26°K ~~carrying a superconducting current~~, said composition comprising at least one each of a IIIB element, and copper oxide.

CLAIM 128 (Currently Amended) A transition metal oxide device comprising: an element capable of carrying a superconductive current comprising a T_c greater than or equal to 26°K and ~~carrying a superconducting current~~, said transition metal oxide device comprising a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 129 (Currently Amended) A copper oxide device comprising: an element capable of carrying a superconductive current comprising a T_C greater than or equal to 26°K and ~~carrying a superconducting current~~ said copper oxide device comprising a copper, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 130 (Currently Amended) A superconductive apparatus comprising: a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or Group III B element, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, a ~~means~~ temperature controller ~~for~~ capable of maintaining said composition at said temperature to exhibit said superconductivity and ~~means~~ a current source ~~for~~ capable of passing an

electrical superconducting current through said composition which exhibiting said superconductivity.

CLAIM 131 (Currently Amended) ~~The combination of claim 15,~~

A superconducting combination, comprising: a superconductive oxide having a transition temperature greater than or equal to 26°K,

a current source ~~for~~ capable of passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said transition temperature, and

a temperature controller ~~for~~ capable of cooling said composition to a superconducting state at a temperature greater than or equal to 26°K;

where said superconductive composition includes a multivalent transition metal, oxygen, and at least one additional element;

where said additional element is a rare earth or Group III B element.

CLAIM 132 (Previously Presented) The combination of claim 12, where said composition includes a substantially perovskite superconducting phase.

CLAIM 133 (Currently Amended) ~~The superconducting apparatus of claim 27,~~

A superconducting apparatus comprising: a composition having a transition temperature greater than or equal to 26°K, said composition being a substituted Cu-oxide including a superconducting phase having a structure which is structurally substantially similar to the orthorhombic-tetragonal phase of said composition, a temperature controller capable of maintaining said composition at a temperature greater than or equal to said transition temperature to put said composition in a superconducting state; and a current

source capable of passing current through said composition while in said superconducting state

where said substituted Cu-oxide includes a rare earth or Group III B element.

CLAIM 134 (Previously Presented) The combination of claim 71, where said mixed copper oxide further includes a rare earth or Group III B element.

CLAIM 135 (Currently Amended) A combination, comprising:

a mixed copper oxide composition including an alkaline earth element (AE) and a rare earth or Group III B element (RE), said composition having a substantially layered crystalline structure and multi-valent oxidation states, said composition exhibiting a substantially zero resistance to the flow of electrical current therethrough when in a superconducting state at a temperature greater than or equal to 26°K, said mixed copper oxide having a superconducting onset temperature greater than or equal to 26°K and,

~~electrical means~~ a current source ~~for~~ capable of passing an electrical superconducting current through said composition when said composition exhibits substantially zero resistance at a temperature greater than or equal to 26°K and less than said onset temperature.

CLAIM 136 (Currently Amended) The combination of claim 77, where said crystalline structure is substantially perovskite.

CLAIM 137 (Currently Amended) An apparatus comprising:

a composition including a transition metal, a rare earth or Group III B element, an alkaline earth element, and oxygen, where said composition is a mixed transition metal

oxide having a non-stoichimetric amount of oxygen therein and exhibiting a superconducting state at a temperature greater than or equal to 26°K,

~~means~~ a temperature controller ~~for~~ capable of maintaining said composition in said superconducting state at a temperature greater than or equal to 26°K, and less than said superconducting onset temperature, and

~~means~~ a current source ~~for~~ capable of passing an electrical current through said composition while said composition is in said superconducting state.

CLAIM 138 (Currently Amended) The apparatus of claim 93, where said ~~copper-~~ transition oxide material exhibits a substantially layered crystalline structure.

CLAIM 139 (Currently Amended) A superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a ~~copper-~~transition metal oxide compound having a substantially layered perovskite crystal structure, the composition having a superconductor transition temperature T_c of greater than or equal to 26°K;

(b) ~~means~~ a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; ~~and~~

(c) ~~means~~ a current source ~~for~~ capable of causing an electric current to flow in the superconductor element, and

(d) at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group

comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 140 (Currently Amended) A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound having a substantially layered perovskite crystal structure, the copper-oxide compound including at least one rare-earth or Group III B element and at least one alkaline-earth element, the composition having a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{r=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) ~~means~~ a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk- resistivity intercept temperature $T_{r=0}$ of the superconductive composition; and

(c) ~~means~~ a current source ~~for~~ capable of causing an electric current to flow in the superconductor element.

CLAIM 141 (Currently Amended) An apparatus comprising: a transition metal oxide having a phase therein which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a temperature controller capable of maintaining the temperature of said material at a temperature less than said critical temperature to produce said superconducting state in said phase, ands

a current source capable of passing an electrical ~~supercurrent~~ through said transition metal oxide while it is in said superconducting state; and

said transition metal oxide comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 142 (Previously Presented) The apparatus of claim 141, where said transition metal oxide is comprised of a transition metal capable of exhibiting multivalent states.

CLAIM 143 (Previously Presented) The apparatus of claim 141, where said transition metal oxide is comprised of a Cu oxide.

CLAIM 144 (Currently Amended) An apparatus comprising:

a composition including a transition metal, a rare earth or rare earth-like element, an alkaline earth element, and oxygen, where said composition is a mixed transition metal oxide having a non-stoichiometric amount of oxygen therein and exhibiting a superconducting state at a temperature greater than or equal to 26°K,

a temperature controller capable of maintaining said composition in said superconducting state at a temperature greater than or equal to 26°K, and

a current source capable of passing an electrical current through said composition while said composition is in said superconducting state.

CLAIM 145 (Allowed) The apparatus of claim 144, where said transition metal is copper.

CLAIM 146 (Currently Amended) An apparatus:

a composition exhibiting a superconductive state at a temperature greater than or equal to 26°K,

a temperature controller capable of maintaining said composition at a temperature greater than or equal to 26°K at which temperature said composition exhibits said superconductive state, ~~and~~

a current source capable of passing an electrical current through said composition while said composition is in said superconductive state; and

said composition comprising a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 147 (Currently Amended) The apparatus of claim 146, where said composition is ~~comprised of a metal oxide~~ layered.

CLAIM 148 (Currently Amended) The apparatus of claim 146, where said composition is ~~comprised of a transition metal oxide~~ comprises a perovskite-like structure.

CLAIM 149 (Currently Amended) A superconductive apparatus for causing electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound having a layer-type perovskite-like crystal structure, the composition having a superconductor transition temperature T_c of greater than or equal to 26°K;

(b) a temperature controller capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; ~~and~~
(c) a current source capable of causing an electric current to flow in the superconductor element; and

(d) said superconductive composition comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 150 (Currently Amended) ~~The superconductive apparatus according to claim 149 in which~~

A superconductive apparatus for causing electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound having a layer-type perovskite-like crystal structure, the composition having a superconductor transition temperature T_c of greater than or equal to 26°K;

(b) a temperature controller capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition;

(c) a current source capable of causing an electric current to flow in the superconductor element; and

(d)the copper-oxide compound of the superconductive composition includes at least one rare-earth or rare-earth-like element and at least one alkaline-earth element.

CLAIM 151 (Allowed) The superconductive apparatus according to claim 150 in which the rare-earth or rare-earth-like element is lanthanum.

CLAIM 152 (Allowed) The superconductive apparatus according to claim 150 in which the alkaline-earth element is barium.

CLAIM 153 (Previously Presented) The superconductive apparatus according to claim 149 in which the copper-oxide compound of the superconductive composition includes mixed valent copper ions.

CLAIM 154 (Previously Presented) The superconductive apparatus according to claim 153 in which the copper-oxide compound includes at least one element in a nonstoichiometric atomic proportion.

CLAIM 155 (Previously Presented) The superconductive apparatus according to claim 154 in which oxygen is present in the copper-oxide compound in a nonstoichiometric atomic proportion.

CLAIM 156 (Currently Amended) A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound having a layer-type perovskite-like crystal structure, the copper-oxide compound including at least one rare-earth or rare-earth-like element and at least one alkaline-earth element, the composition having a superconductive/resistive-transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-

bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk- resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and
(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 157 (Allowed) The superconductive apparatus according to claim 156 in which the rare-earth or rare-earth-like element is lanthanum.

CLAIM 158 (Allowed) The superconductive apparatus according to claim 156 in which the alkaline-earth element is barium.

CLAIM 159 (Allowed) The superconductive apparatus according to claim 156 in which the copper-oxide compound of the superconductive composition includes mixed valent copper ions.

CLAIM 160 (Allowed) The superconductive apparatus according to claim 159 in which the copper-oxide compound includes at least one element in a nonstoichiometric atomic proportion.

CLAIM 161 (Allowed) The superconductive apparatus according to claim 160 in which oxygen is present in the copper-oxide compound in a nonstoichiometric atomic proportion.

CLAIM 162 (Currently Amended) An apparatus comprising: copper oxide having a phase therein which exhibits a superconducting state at a critical temperature greater than or equal to 26°K;

a temperature controller capable of maintaining the temperature of said material at a temperature less than said critical temperature to produce said superconducting state in said phase;

a current source capable of passing an electrical supercurrent through said copper oxide while it is in said superconducting state;

said copper oxide includes at least one element selected from the group consisting of a Group II A element, a rare earth element and a Group III B element.

CLAIM 163 (Currently Amended) An apparatus comprising:

a composition comprising copper, oxygen and any element selected from the group consisting of a Group II A element, a rare earth element and a Group III B element, where said composition is a mixed copper oxide having a non-stoichiometric amount of oxygen therein and exhibiting a superconducting state at a temperature greater than or equal to 26°K;

a temperature controller capable of maintaining said composition in said superconducting state at a temperature greater than or equal to 26°K; and

a current source capable of passing an electrical current through said composition while said composition is in said superconducting state.

CLAIM 164 (Currently Amended) An apparatus comprising:

a composition exhibiting a superconductive state at a temperature greater than or equal to 26°K;

a temperature controller capable of maintaining said composition at a temperature greater than or equal to 26°K at which temperature said composition exhibits said superconductive state;

a current source capable of passing an electrical current through said composition while said composition is in said superconductive state; and

said composition including a copper oxide and an element selected from the group consisting of Group II A element, a rare earth element and a Group III B element.

CLAIM 165 (Currently Amended) An apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound having a layer-type perovskite-like crystal structure, the composition having a superconductive transition temperature T_c of greater than or equal to 26°K, said superconductive composition includes at least one element selected from the group consisting of a Group II A element, a rare earth element; and a Group III B element;

(b) a temperature controller capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 166 (Currently Amended) An apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound having a layer-type perovskite-like crystal structure, the copper-oxide compound including at least one element selected from the group consisting of a Group II A element, a rare earth element and a Group III B element, the composition having a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{p=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk- resistivity intercept temperature $T_{p=0}$ of the superconductive composition; and

(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 167 (Currently Amended) An apparatus comprising:

a copper oxide having a phase therein which exhibits a superconducting state at a critical temperature greater than or equal to 26°K;

a temperature controller capable of maintaining the temperature of said material at a temperature less than said critical temperature to produce said superconducting state in said phase;

a current source capable of passing an electrical supercurrent through said copper oxide while it is in said superconducting state;

said copper oxide includes an element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element.

CLAIM 168 (Currently Amended) An apparatus comprising:

a composition including copper, oxygen and an element selected from the group consisting of at least one Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element, where said composition is a mixed copper oxide having a non-stoichiometric amount of oxygen therein and exhibiting a superconducting state at a temperature greater than or equal to 26°K;

a temperature controller capable of maintaining said composition in said superconducting state at a temperature greater than or equal to 26°K; and

a current source capable of passing an electrical current through said composition while said composition is in said superconducting state.

CLAIM 169 (Currently Amended) An apparatus comprising:

a composition exhibiting a superconductive state at a temperature greater than or equal to 26°K;

a temperature controller capable of maintaining said composition at a temperature greater than or equal to 26°K at which temperature said composition exhibits said superconductive state;

a current source capable of passing an electrical current through said composition while said composition is in said superconductive state; and

said composition including a copper oxide and at least one element selected from the group consisting of Group II A and at least one element selected from the group consisting of a rare earth element and a Group III B element.

CLAIM 170 (Currently Amended) A superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound having a layer-type perovskite-like crystal structure, the composition having a superconductive transition temperature T_c of greater than or equal to 26°K, said superconductive composition includes at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element;

(b) a temperature controller capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 171 (Currently Amended) A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound having a layer-type perovskite-like crystal structure, the copper-oxide compound including at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a

Group III B element, the composition having a superconductive/resistive transition defining a superconductive-resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk- resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 172 (Currently Amended) An apparatus comprising:

a transition metal oxide having a phase therein which exhibits a superconducting state at a critical temperature greater than or equal to 26°K;

a temperature controller capable of maintaining the temperature of said material at a temperature less than said critical temperature to produce said superconducting state in said phase;

a current source capable of passing an electrical supercurrent through said copper oxide while it is in said superconducting state;

said transitional metal oxide includes at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element.

CLAIM 173 (Currently Amended) An apparatus comprising:

a composition including a transition metal, oxygen and an element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element, where said composition is a mixed transitional metal oxide formed from said transition metal and said oxygen, said mixed transition metal oxide having a non-stoichiometric amount of oxygen therein and exhibiting a superconducting state at a temperature greater than or equal to 26°K;

a temperature controller capable of maintaining said composition in said superconducting state at a temperature greater than or equal to 26°K; and

a current source capable of passing an electrical current through said composition while said composition is in said superconducting state.

CLAIM 174 (Currently Amended) An apparatus:

forming a composition exhibiting a superconductive state at a temperature greater than or equal to 26°K;

a temperature controller capable of maintaining said composition at a temperature greater than or equal to 26°K at which temperature said composition exhibits said superconductive state;

a current source capable of passing an electrical current through said composition while said composition is in said superconductive state; and

said composition including a transitional metal oxide and at least one element selected from the group consisting of Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element.

CLAIM 175 (Currently Amended) A superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a transition metal oxide compound having a layer-type perovskite-like crystal structure, the composition having a superconductive transition temperature T_c of greater than or equal to 26°K, said superconductive composition includes an element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element;

(b) a temperature controller capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition T_c of the superconductive composition; and

(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 176 (Currently Amended) A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a transition metal-oxide compound having a layer-type perovskite-like crystal structure, the transition metal-oxide compound including at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element, the composition having a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c

and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 177 (Currently Amended) An apparatus comprising:

a copper oxide having a phase therein which exhibits a superconducting state at a critical temperature greater than or equal to 26°K;

a temperature controller capable of maintaining the temperature of said material at a temperature less than said critical temperature to produce said superconducting state in said phase;

a current source capable of passing an electrical supercurrent through said copper oxide while it is in said superconducting state;

said copper oxide includes at least one Group II A element, and at least one element selected from the group consisting of a rare earth element and a Group III B element.

CLAIM 178 (Currently Amended) An apparatus comprising:

a composition including copper, oxygen, a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element, where said composition is a mixed copper oxide having a non-stoichiometric amount of

oxygen therein and exhibiting a superconducting state at a temperature greater than or equal to 26°K;

a temperature controller capable of maintaining said composition in said superconducting state at a temperature greater than or equal to 26°K; and

a current source capable of passing an electrical current through said composition while said composition is in said superconducting state.

CLAIM 179 (Currently Amended) A structure comprising:

a composition exhibiting a superconductive state at a temperature greater than or equal to 26°K;

a temperature controller capable of maintaining said composition at a temperature greater than or equal to 26°K at which temperature said composition exhibits said superconductive state;

a current source capable of passing an electrical current through said composition while said composition is in said superconductive state; and

said composition including a copper oxide, a Group II A element, at least one element selected from the group consisting of a rare earth element and a Group III B element.

CLAIM 180 (Currently Amended) A superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound having a layer-type perovskite-like crystal structure, the composition having a superconductive

transition temperature T_c of greater than or equal to 26°K, said superconductive composition includes a Group II A element, and at least one element selected from the group consisting of a rare earth element and a Group III B element;

(b) a temperature controller capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and
(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 181 (Currently Amended) A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound having a layer-type perovskite-like crystal structure, the copper-oxide compound including Group II A element, and at least one element selected from the group consisting of a rare earth element and a Group III B element, the composition having a superconductive-resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{p=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{p=0}$ of the superconductive composition; and
(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 182 (Currently Amended) An apparatus comprising: a composition having a transition temperature greater than or equal to 26°K, the composition including a rare

earth or alkaline earth element, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, a temperature controller capable of maintaining said composition at said temperature to exhibit said superconductivity and a current source capable of passing an electrical superconducting current through said composition with said phrase exhibiting said superconductivity.

CLAIM 183 (Currently Amended) An apparatus comprising: an element capable of carrying a superconductive current comprising a superconducting transition metal oxide having a superconductive onset temperature greater than or equal to 26°K, a temperature controller capable of maintaining said superconducting transition metal oxide at a temperature less than said superconducting onset temperature and a current source ~~flowing a superconducting current therein~~, and said composition comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 184 (Currently Amended) An apparatus comprising: an element capable of carrying a superconductive current comprising a superconducting copper oxide having a superconductive onset temperature greater than or equal to 26°K, a temperature controller capable of maintaining said superconducting copper oxide at a temperature less than said superconducting onset temperature and a current source ~~flowing a superconducting current in said superconducting oxide~~, and said superconducting copper oxide further comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 185 (Currently Amended) An apparatus comprising: an element capable of carrying a superconductive current comprising a superconducting oxide composition having a superconductive onset temperature greater than or equal to 26°K, a temperature controller capable of maintaining said superconducting copper oxide at a temperature less than said superconducting onset temperature and a current source ~~flowing a superconducting current therein~~, said composition comprising at least one each of rare earth, an alkaline earth, and copper.

CLAIM 186 (Currently Amended) An apparatus comprising: an element capable of carrying a superconductive current comprising a superconducting oxide composition having a superconductive onset temperature greater than or equal to 26°K, a temperature controller capable of maintaining said superconducting copper oxide at a temperature less than said superconducting onset temperature and a current source ~~flowing a superconducting electrical current therein~~, said composition comprising at least one each of a Group III B element, an alkaline earth, and copper.

CLAIM 187 (Currently Amended) An apparatus comprising: an element capable of carrying a superconducting electrical current in a transition metal oxide having a T_c greater than or equal to 26°K ~~and~~, a temperature controller capable of maintaining said transition metal oxide at a temperature less than said T_c, and said transition metal oxide comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 188 (Currently Amended) An apparatus comprising: a current source ~~flowing a superconducting current in~~, an element capable of carrying a superconductive current comprising a copper oxide having a T_c greater than or equal to 26°K and a temperature controller capable of maintaining said copper oxide at a temperature less than said T_c, and said copper oxide comprising at least one element selected from the group

consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements

CLAIM 189 (Currently Amended) An apparatus comprising:

a composition of the formula $BaLa_{5-x}Cu_5O_{5(3-y)}$, wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K;
a temperature controller capable of maintaining the temperature of said composition at a temperature less than said critical temperature to induce said superconducting state in said metal oxide phase; and

a current source capable of passing an electrical current through said composition while said metal oxide phase is in said superconducting state.

CLAIM 190 (Currently Amended) An apparatus comprising: a current source ~~flowing a superconducting electrical current in~~ and an element capable of carrying a superconductive current comprising a composition of matter having a T_c greater than or equal to 26°K, said composition comprising at least one each of a Group III B element, an alkaline earth, and copper oxide and a temperature controller capable of maintaining said composition of matter at a temperature less than T_c.

CLAIM 191 (Currently amended) An apparatus comprising: a current source ~~flowing a superconducting electrical current in~~ and an element capable of carrying a superconductive current comprising a composition of matter having a T_c greater than or equal to 26°K, said composition comprising at least one each of a rare earth, alkaline

earth, and copper oxide and a temperature controller capable of maintaining said composition of matter at a temperature less than said T_c.

CLAIM 192 (Currently Amended) An apparatus comprising: a current ~~source flowing a superconducting electrical current in~~ and an element capable of carrying a superconductive current comprising a composition of matter having a T_c greater than or equal to 26°K, said composition comprising at least one each of a rare earth, and copper oxide and a temperature controller capable of maintaining said composition of matter at a temperature less than said T_c.

CLAIM 193 (Currently Amended) An apparatus comprising: a current source ~~flowing a superconducting electrical current in~~ and an element capable of carrying a superconductive current comprising a composition of matter having a T_c greater than or equal to 26°K carrying, said composition comprising at least one each of a Group III B element, and copper oxide and a temperature controller capable of maintaining said composition of matter at a temperature less than said T_c.

CLAIM 194 (Currently Amended) An apparatus comprising: a current source ~~flowing a superconducting electrical current in~~ and an element capable of carrying a superconductive current comprising a transition metal oxide comprising a T_c greater than or equal to 26°K and a temperature controller capable of maintaining said transition metal oxide at a temperature less than said T_c, said composition comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements

CLAIM 195 (Currently Amended) An apparatus comprising: a current source ~~flowing a superconducting electrical current in~~ and an element capable of carrying a superconductive current comprising a copper oxide composition of matter comprising a T_c greater than or equal to 26°K and a temperature controller capable of maintaining

said copper oxide composition of matter at a temperature less than said T_c, said copper oxide composition comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 196 (Currently Amended) An apparatus comprising:

a composition including a transition metal, a Group III B element, an alkaline earth element, and oxygen, where said composition is a mixed transition metal oxide having a non-stoichiometric amount of oxygen therein and exhibiting a superconducting state at a temperature greater than or equal to 26°K,

a temperature controller capable of maintaining said composition in said superconducting state at a temperature greater than or equal to 26°K, and

a current source capable of passing an electrical current through said composition while said composition is in said superconducting state.

CLAIM 197 (Allowed) The apparatus of claim 196, where said transition metal is copper.

CLAIM 198 (Currently Amended) A superconductive apparatus for causing electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound having a substantially layered perovskite crystal structure, the composition having a superconductor transition temperature T_c of greater than or equal to 26°K;

(b) a temperature controller capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; ~~and~~

(c) a current source capable of causing an electric current to flow in the superconductor element; and

(d) the superconductive composition comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 199 (Currently Amended) A superconductive apparatus for causing electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound having a substantially layered perovskite crystal structure, the composition having a superconductor transition temperature T_c of greater than or equal to 26°K;

(b) a temperature controller capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition;

(c) a current source capable of causing an electric current to flow in the superconductor element; and

~~The superconductive apparatus according to claim 198 in which~~ the copper-oxide compound of the superconductive composition includes at least one element selected

from the group consisting of a rare-earth element, a Group III B element and an alkaline-earth element.

CLAIM 200 (Previously Presented) The superconductive apparatus according to claim 199 in which the rare-earth is lanthanum.

CLAIM 201 (Previously Presented) The superconductive apparatus according to claim 199 in which the alkaline-earth element is barium.

CLAIM 202 (Previously Presented) The superconductive apparatus according to claim 198 in which the copper-oxide compound of the superconductive composition includes mixed valent copper ions.

CLAIM 203 (Previously Presented) The superconductive apparatus according to claim 202 in which the copper-oxide compound includes at least one element in a nonstoichiometric atomic proportion.

CLAIM 204 (Previously Presented) The superconductive apparatus according to claim 203 in which oxygen is present in the copper-oxide compound in a nonstoichiometric atomic proportion.

CLAIM 205 (Currently Amended) A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound having a substantially layered perovskite crystal structure, the copper-oxide compound including at least one element selected from the group consisting of a rare-earth element, a Group III B element and an alkaline-earth element, the composition having a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c

and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and
(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 206 (Previously Presented) The superconductive apparatus according to claim 205 in which said at least one element is lanthanum.

CLAIM 207 (Previously Presented) The superconductive apparatus according to claim 205 in which the alkaline-earth element is barium.

CLAIM 208 (Previously Presented) The superconductive apparatus according to claim 205 in which the copper-oxide compound of the superconductive composition includes mixed valent copper ions.

CLAIM 209 (Previously Presented) The superconductive apparatus according to claim 208 in which the copper-oxide compound includes at least one element in a nonstoichiometric atomic proportion.

CLAIM 210 (Previously Presented) The superconductive apparatus according to claim 209 in which oxygen is present in the copper-oxide compound in a nonstoichiometric atomic proportion.

CLAIM 211 (Currently Amended) A superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound having a substantially layered perovskite crystal structure, the composition having a superconductive transition temperature T_c of greater than or equal to 26°K, said superconductive composition includes at least one element selected from the group consisting of a Group II A element, a rare earth element; and a Group III B element;
(b) a temperature controller capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 212 (Currently Amended) A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound having a substantially layered perovskite crystal structure, the copper-oxide compound including at least one element selected from the group consisting of a Group II A element, a rare earth element and a Group III B element, the composition having a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 213 (Currently Amended) A superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound having a substantially layered perovskite crystal structure, the composition having a superconductive transition temperature T_c of greater than or equal to 26°K, said superconductive composition includes a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element;

(b) a temperature controller capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 214 (A Currently Amended) A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound having a substantially layered perovskite crystal structure, the copper-oxide compound including a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element, the composition having a superconductive/resistive transition defining a superconductive-resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c

and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 215 (Currently Amended) A superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:
(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a transition metal oxide compound having a substantially layered perovskite crystal structure, the composition having a superconductive transition temperature T_c of greater than or equal to 26°K, said superconductive composition includes a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element;

(b) a temperature controller capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition T_c of the superconductive composition; and

(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 216 (A Currently Amended) A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a transition metal-oxide compound having a substantially layered perovskite crystal structure, the transition metal-oxide compound including a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element, the composition having a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and
(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 217 (Previously Presented) An apparatus according to claim 182 wherein said composition comprises a substantially layered perovskite crystal structure.

CLAIM 218 (Currently Amended) An apparatus according to claim 183 wherein said superconducting ~~transistor~~ transition metal oxide comprises a substantially layered perovskite crystal structure.

CLAIM 219 (Previously Presented) An apparatus according to claim 184 wherein said superconducting copper oxide comprises a substantially layered perovskite crystal structure.

CLAIM 220 (Allowed) An apparatus according to claim 185 wherein said superconducting oxide composition comprises a substantially layered perovskite crystal structure.

CLAIM 221 (Allowed) An apparatus according to claim 186 wherein said superconducting oxide composition comprises a substantially layered perovskite crystal structure.

CLAIM 222 (Currently Amended) An apparatus according to claim 187 wherein said ~~transistor~~ transition metal oxide comprises a substantially layered perovskite crystal structure.

CLAIM 223 (Previously Presented) An apparatus according to claim 188 wherein said copper oxide comprises a substantially layered perovskite crystal structure.

CLAIM 224 (Allowed) An apparatus according to claim 189 wherein said composition comprises a substantially layered perovskite crystal structure.

CLAIM 225 (Allowed) An apparatus according to claim 190 wherein said composition of matter comprises a substantially layered perovskite crystal structure.

CLAIM 226 (Allowed) An apparatus according to claim 191 wherein said composition of matter comprises substantially layered perovskite crystal structure.

CLAIM 227 (Previously Presented) An apparatus according to claim 192 wherein said composition of matter comprises a substantially layered perovskite crystal structure.

CLAIM 228 (Previously Presented) An apparatus according to claim 193 wherein said composition of matter comprises substantially layered perovskite crystal structure.

CLAIM 229 (Currently Amended) An apparatus according to claim 194 wherein said ~~transistor~~ transition metal oxide comprises substantially layered perovskite crystal structure.

CLAIM 230 (Allowed) An apparatus according to claim 195 wherein said copper oxide composition comprises substantially layered perovskite crystal structure.

CLAIM 231 (Currently Amended) An apparatus comprising: a composition of matter having a T_c greater than or equal to 26°K capable of carrying a superconducting current, said composition comprising at least one each of a rare earth, an alkaline earth, and copper oxide.

CLAIM 232 (Currently Amended) An apparatus comprising:

a transition metal oxide comprising a phase therein which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a temperature controller ~~for~~ capable of maintaining the temperature of said material at a temperature less than said critical temperature to produce said superconducting state in said phase, ~~and~~

a source capable of providing :an electrical ~~super~~current through said transition metal oxide while it is in said superconducting state, and

said transition metal oxide comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements

.

CLAIM 233 (Previously Presented) An apparatus according to claim 232, where said transition metal oxide is comprised of a transition metal capable of exhibiting multivalent states.

CLAIM 234 (Previously Presented) An apparatus according to claim 232, where said transition metal oxide is comprised of a Cu oxide.

CLAIM 235 (Currently Amended) An apparatus comprising:

a composition including a transition metal, a rare earth or rare earth-like element, an alkaline earth element, and oxygen, where said composition is a mixed transition metal oxide comprising a non-stoichiometric amount of oxygen therein and exhibiting a superconducting state at a temperature greater than or equal to 26°K,

a temperature controller ~~for~~ capable of maintaining said composition in said superconducting state at a temperature greater than or equal to 26°K, and

a source capable of providing an electrical current through said composition while said composition is in said superconducting state.

CLAIM 236 (Allowed) An apparatus according to claim 235, where said transition metal is copper.

CLAIM 237 (Currently Amended) An apparatus comprising:

a composition exhibiting a superconductive state at a temperature greater than or equal to 26°K, a temperature controller ~~for~~ capable of maintaining said composition at a temperature greater than or equal to 26°K at which temperature said composition exhibits said superconductive state, ~~and~~

a source capable of providing an electrical current through said composition while said composition is in said superconductive state, and

said composition comprising a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and

combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 238 (Currently Amended) An apparatus according to claim 237, where said composition is comprised of a ~~metal oxide~~ structure selected from the group consisting of a perovskite structure, a substantially perovskite structure, a perovskite-like structure, a perovskite type structure, a structure comprising a perovskite characteristic, and a perovskite related structure, .

CLAIM 239 (Currently Amended) An apparatus according to claim 238, where said composition is comprised of a ~~transition metal oxide~~ structure slected from the group consisting of a layered structure, a layered crystalline structure, a substantially layered structure, a substantially layered crystalline structure, a layered-like structure, a layered-type structure, and a layered characteristic.

CLAIM 240 (Currently Amended) An apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a layer-type perovskite-like crystal structure, the composition comprising a superconductor transition temperature T_c of greater than or equal to 26°K;

(b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; ~~and~~

(c) a source capable of providing an electric current to flow in the superconductor element, and

(d) said superconductive composition at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 241 (Currently Amended) ~~An apparatus according to claim 240 in which~~ An apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a layer-type perovskite-like crystal structure, the composition comprising a superconductor transition temperature T_c of greater than or equal to 26°K;

(b) a temperature controller capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition;

(c) a source capable of providing an electric current to flow in the superconductor element, and

(d) the copper-oxide compound of the superconductive composition includes at least one rare-earth or rare-earth-like element and at least one alkaline-earth element.

CLAIM 242 (Allowed) An apparatus according to claim 241 in which the rare-earth or rare-earth-like element is lanthanum.

CLAIM 243 (Allowed) An apparatus according to claim 241 in which the alkaline-earth element is barium.

CLAIM 244 (Previously Presented) An apparatus according to claim 240 in which the copper-oxide compound of the superconductive composition includes mixed valent copper ions.

CLAIM 245 (Previously Presented) An apparatus according to claim 244 in which the copper-oxide compound includes at least one element in a nonstoichiometric atomic proportion.

CLAIM 246 (Previously Presented) An apparatus according to claim 245 in which oxygen is present in the copper-oxide compound in a nonstoichiometric atomic proportion.

CLAIM 247 (Currently Amended) An apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a layer-type perovskite-like crystal structure, the copper-oxide compound including at least one rare-earth or rare-earth-like element and at least one alkaline-earth element, the composition comprising a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a source capable of providing an electric current to flow in the superconductor element.

CLAIM 248 (Allowed) An apparatus according to claim 247 in which the rare-earth or rare-earth-like element is lanthanum.

CLAIM 249 (Allowed) An apparatus according to claim 247 in which the alkaline-earth element is barium.

CLAIM 250 (Allowed) An apparatus according to claim 247 in which the copper-oxide compound of the superconductive composition includes mixed valent copper ions.

CLAIM 251 (Allowed) An apparatus according to claim 250 in which the copper-oxide compound includes at least one element in a nonstoichiometric atomic proportion.

CLAIM 252 (Allowed) An apparatus according to claim 251 in which oxygen is present in the copper-oxide compound in a nonstoichiometric atomic proportion.

CLAIM 253 (Currently Amended) An apparatus comprising:

a copper oxide comprising a phase therein which exhibits a superconducting state at a critical temperature greater than or equal to 26°K;

a temperature controller ~~for~~ capable of maintaining the temperature of said material at a temperature less than said critical temperature to produce said superconducting state in said phase;

a source capable of providing an electrical ~~supercurrent~~ through said copper oxide while it is in said superconducting state;

said copper oxide includes at least one element selected from the group consisting of a Group II A element, a rare earth element and a Group III B element.

CLAIM 254 (Currently Amended) An apparatus comprising:

a composition including copper, oxygen and an element selected from the group consisting of a Group II A element, a rare earth element and a Group III B element, where said composition is a mixed copper oxide comprising a non-stoichiometric amount of oxygen therein and exhibiting a superconducting state at a temperature greater than or equal to 26°K;

a temperature controller ~~for~~ capable of maintaining said composition in said superconducting state at a temperature greater than or equal to 26°K; and

a source capable of providing an electrical current through said composition while said composition is in said superconducting state.

CLAIM 255 (Currently Amended) An apparatus comprising:

a composition exhibiting a superconductive state at a temperature greater than or equal to 26°K;

a temperature controller ~~for~~ capable of maintaining said composition at a temperature greater than or equal to 26°K at which temperature said composition exhibits said superconductive state;

a source capable of providing an electrical current through said composition while said composition is in said superconductive state; and

said composition including a copper oxide and an element selected from the group consisting of Group II A element, a rare earth element and a Group III B element.

CLAIM 256 (Currently Amended) An apparatus capable of carrying an electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a layer-type perovskite-like crystal structure, the composition comprising a superconductive transition temperature T_c of greater than or equal to 26°K, said superconductive composition includes at least one element selected from the group consisting of a Group II A element, a rare earth element; and a Group III B element;

(b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a source capable of providing an electric current to flow in the superconductor element.

CLAIM 257 (Currently Amended) An apparatus capable of carrying an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a layer-type perovskite-like crystal structure, the copper-oxide compound including at least one element selected from the group consisting of a Group II A element, a rare earth element and a Group III B element, the composition comprising a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{p=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a source capable of providing an electric current to flow in the superconductor element.

CLAIM 258 (Currently Amended) An apparatus comprising:

a copper oxide comprising a phase therein which exhibits a superconducting state at a critical temperature greater than or equal to 26°K;

a temperature controller ~~for~~ capable of maintaining the temperature of said material at a temperature less than said critical temperature to produce said superconducting state in said phase;

a source capable of providing an electrical ~~super~~current through said copper oxide while it is in said superconducting state;

said copper oxide includes at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element.

CLAIM 259 (Currently Amended) An apparatus comprising:

a composition including copper, oxygen and an element selected from the group consisting of at least one Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element, where said composition is a mixed copper oxide comprising a non-stoichiometric amount of oxygen

therein and exhibiting a superconducting state at a temperature greater than or equal to 26°K;

a temperature controller capable of ~~for~~ maintaining said composition in said superconducting state at a temperature greater than or equal to 26°K; and

a source capable of providing an electrical current through said composition while said composition is in said superconducting state.

CLAIM 260 (Currently Amended) An apparatus comprising:

a composition exhibiting a superconductive state at a temperature greater than or equal to 26°K;

a temperature controller capable of ~~for~~ maintaining said composition at a temperature greater than or equal to 26°K at which temperature said composition exhibits said superconductive state;

a source capable of providing an electrical current through said composition while said composition is in said superconductive state; and

said composition including a copper oxide and at least one element selected from the group consisting of Group II A and at least one element selected from the group consisting of a rare earth element and a Group III B element.

CLAIM 261 (Currently Amended) An apparatus capable of carrying an electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound

comprising a layer-type perovskite-like crystal structure, the composition comprising a superconductive transition temperature T_c of greater than or equal to 26°K, said superconductive composition includes at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element;

(b) a temperature controller capable of ~~for~~ maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a source capable of providing an electric current to flow in the superconductor element.

CLAIM 262 (Currently Amended) An apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a layer-type perovskite-like crystal structure, the copper-oxide compound including at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element, the composition comprising a superconductive/resistive transition defining a superconductive-resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{p=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{p=0}$ of the superconductive composition; and

(c) a source capable of providing an electric current to flow in the superconductor element.

CLAIM 263 (Currently Amended) An apparatus comprising:

a transition metal oxide comprising a phase therein which exhibits a superconducting state at a critical temperature greater than or equal to 26°K;

a temperature controller ~~for~~ capable of maintaining the temperature of said material at a temperature less than said critical temperature to produce said superconducting state in said phase;

a source capable of providing an electrical ~~supercurrent~~ through said transition metal oxide while it is in said superconducting state;

said transitional metal oxide includes at least one element selected from the group consisting of a Group II A element and at lest one element selected from the group consisting of a rare earth element and a Group III B element.

CLAIMS 264 (Currently Amended) An apparatus comprising:

a composition including a transition metal, oxygen and an element selected from the group consisting of at least one Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element, where said composition is a mixed transitional metal oxide formed from said transition metal and said oxygen, said mixed transition metal oxide comprising a non-stoichiometric amount of oxygen therein and exhibiting a superconducting state at a temperature greater than or equal to 26°K;

a temperature controller ~~for~~ capable of maintaining said composition in said superconducting state at a temperature greater than or equal to 26°K; and

a source capable of providing an electrical current through said composition while said composition is in said superconducting state.

CLAIM 265 (Currently Amended) An apparatus comprising:

a composition exhibiting a superconductive state at a temperature greater than or equal to 26°K;

a temperature controller ~~for~~ capable of maintaining said composition at a temperature greater than or equal to 26°K at which temperature said composition exhibits said superconductive state;

a source capable of providing an electrical current through said composition while said composition is in said superconductive state; and

said composition including a transitional metal oxide and at least one element selected from the group consisting of Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element.

CLAIM 266 (Currently Amended) An apparatus capable of carrying an electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a transition metal oxide compound comprising a layer-type perovskite-like crystal structure, the composition comprising a superconductive transition temperature T_c of greater than or equal to 26°K, said superconductive composition includes at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element;

(b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition T_c of the superconductive composition; and

(c) a source of an electric current to flow in the superconductor element.

CLAIM 267 (Currently Amended) An apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a transition metal-oxide compound comprising a layer-type perovskite-like crystal structure, the transition metal-oxide compound including at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element, the composition comprising a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a source of an electric current to flow in the superconductor element.

CLAIM 268 (Currently Amended) An apparatus comprising:

a copper oxide comprising a phase therein which exhibits a superconducting state at a critical temperature greater than or equal to 26°K;

a temperature controller ~~for~~ capable of maintaining the temperature of said material at a temperature less than said critical temperature to produce said superconducting state in said phase;

a source capable of providing~~for~~ an electrical ~~super~~current through said copper oxide while it is in said superconducting state;

said copper oxide includes at least one element selected from group consisting of a Group II A element, at least one element selected from the group consisting of a rare earth element and at least one element selected from the group consisting of a Group III B element.

CLAIM 269 (Currently Amended) An apparatus comprising:

a composition including copper, oxygen and an element selected from the group consisting of at least one Group II A element and at least one element selected from the group consisting of a rare earth element at least one element selected from the group consisting of a Group III B element, where said composition is a mixed copper oxide comprising a non-stoichiometric amount of oxygen therein and exhibiting a superconducting state at a temperature greater than or equal to 26°K;

a temperature controller ~~for~~ capable of maintaining said composition in said superconducting state at a temperature greater than or equal to 26°K; and

a source capable of passing an electrical current through said composition while said composition is in said superconducting state.

CLAIM 270 (Currently Amended) An apparatus comprising:

a composition exhibiting a superconductive state at a temperature greater than or equal to 26°K;

a temperature controller ~~for~~ capable of maintaining said composition at a temperature greater than or equal to 26°K at which temperature said composition exhibits said superconductive state;

a source capable of providing an electrical current through said composition while said composition is in said superconductive state; and

said composition including a copper oxide and at least one element selected from the group consisting of Group II A element, at least one element selected from the group consisting of a rare earth element and at least one element selected from the group consisting of a Group III B element.

CLAIM 271 (Currently Amended) An apparatus for causing an electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a layer-type perovskite-like crystal structure, the composition comprising a superconductive transition temperature T_c of greater than or equal to 26°K, said superconductive composition includes at least one element selected from the group consisting of a Group II A element, at least one element selected from the group consisting of a rare earth element and at least one element selected from the group consisting of a Group III B element;

(b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a source capable of providing an electric current to flow in the superconductor element.

CLAIM 272 (Currently Amended) An apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a layer-type perovskite-like crystal structure, the copper-oxide compound including at least one element selected from the group consisting of a group II A element, at least one element selected from the group consisting of a rare earth element and at least one element selected from the group consisting of a Group III B element, the composition comprising a superconductive-resistive transition temperature defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a source capable of providing an electric current to flow in the superconductor element.

CLAIM 273 (Currently Amended) An apparatus comprising: a composition comprising a transition temperature greater than or equal to 26°K, the composition including a rare earth or alkaline earth element, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, a temperature controller ~~for~~ capable of maintaining said composition at said temperature to exhibit said superconductivity and a source of an electrical superconducting current through said composition with said phrase exhibiting said superconductivity.

CLAIM 274 (Currently Amended) An apparatus comprising: providing a superconducting transition metal oxide comprising a superconductive onset temperature greater than or equal to 26°K, a temperature controller ~~for~~ capable of maintaining said superconducting transition metal oxide at a temperature less than said superconducting onset temperature and a source of a superconducting current therein said superconductive transition metal oxide comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 275 (Currently Amended) An apparatus comprising: a superconducting copper oxide comprising a superconductive onset temperature greater than or equal to 26°K, a temperature controller ~~for~~ capable of maintaining said superconducting copper oxide at a temperature less than said superconducting onset temperature and a source of a superconducting current in said superconducting copper oxide, said superconductive copper oxide comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 276 (Currently Amended) An apparatus comprising: a superconducting oxide composition comprising a superconductive onset temperature greater than or equal to 26°K , a temperature controller ~~for~~ capable of maintaining said superconducting copper oxide at a temperature less than said superconducting onset temperature and a source of a superconducting current therein, said composition comprising at least one each of rare earth, an alkaline earth, and copper.

CLAIM 277 (Currently Amended) An apparatus comprising: a superconducting oxide composition comprising a superconductive onset temperature greater than or equal to 26°K, a temperature controller for ~~for~~ capable of maintaining said superconducting copper oxide at a temperature less than said superconducting onset temperature and a source of a superconducting electrical current therein, said composition comprising at least one each of a Group III B element, an alkaline earth, and copper.

CLAIM 278 (Currently Amended) An apparatus comprising: a source of a superconducting electrical current in a transition metal oxide comprising a T_c greater than or equal to 26°K and a temperature controller ~~for~~ capable of maintaining said transition metal oxide at a temperature less than said T_c, said transition metal oxide comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 279 (Currently Amended) An apparatus comprising: a source of a superconducting current in a copper oxide comprising a T_c greater than or equal to 26°K and a temperature controller ~~for~~ capable of maintaining said copper oxide at a temperature less than said T_c, said copper oxide comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 280 (Currently Amended) An apparatus comprising:

a composition of the formula Ba_xLa_{x-5}, Cu_5O_Y, wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to

about 12 hours, said composition comprising a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K;

a temperature controller ~~for~~ capable of maintaining the temperature of said composition at a temperature less than said critical temperature to induce said superconducting state in said metal oxide phase; and

a source capable of providing an electrical current through said composition while said metal oxide phase is in said superconducting state.

CLAIM 281 (Currently Amended) An apparatus comprising: a source of a superconducting electrical current in a composition of matter comprising a T_c greater than or equal to 26°K, said composition comprising at least one each of a III B element, an alkaline earth, and copper oxide and a temperature controller ~~for~~ capable of maintaining said composition of matter at a temperature less than T_c.

CLAIM 282 (Currently Amended) An apparatus comprising: a source of a superconducting electrical current in a composition of matter comprising a T_c greater than or equal to 26°K, said composition comprising at least one each of a rare earth, alkaline earth, and copper oxide and a temperature controller for ~~for~~ capable of maintaining said composition of matter at a temperature less than said T_c.

CLAIM 283 (Currently Amended) An apparatus comprising: a source of a superconducting electrical current in a composition of matter comprising a T_c greater than or equal to 26°K, said composition comprising at least one each of a rare earth, and copper oxide and a temperature controller ~~for~~ capable of maintaining said composition of matter at a temperature less than said T_c.

CLAIM 284 (Currently Amended) An apparatus comprising: a source of a superconducting electrical current in a composition of matter comprising a T_c greater than or equal to 26°K carrying, said composition comprising at least one each of a III B

element, and copper oxide and a temperature controller ~~for~~ capable of maintaining said composition of matter at a temperature less than said T_c.

CLAIM 285 (Currently Amended) An apparatus comprising: a source of a superconducting electrical current in a transition metal oxide comprising a T_c greater than or equal to 26°K and a temperature controller ~~for~~ capable of maintaining said transition metal oxide at a temperature less than said T_c, said transition mental oxide comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 286 (Currently Amended) An apparatus comprising: a source of a superconducting electrical current in a copper oxide composition of matter comprising a T_c greater than or equal to 26°K and a temperature controller ~~for~~ capable of maintaining said copper oxide composition of matter at a temperature less than said T_c, said copper oxide comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 287 (Currently Amended) An apparatus comprising:

a composition including a transition metal, a group IIIB element, an alkaline earth element, and oxygen, where said composition is a mixed transition metal oxide comprising a non-stoichiometric amount of oxygen therein and exhibiting a superconducting state at a temperature greater than or equal to 26°K,

a temperature controller ~~for~~ capable of maintaining said composition in said superconducting state at a temperature greater than or equal to 26°K, and

a source capable of of providing an electrical current through said composition while said composition is in said superconducting state.

CLAIM 288 (Allowed) An apparatus according to claim 287, where said transition metal is copper.

CLAIM 289 (Currently Amended) An apparatus for causing electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a substantially layered perovskite crystal structure, the composition comprising a superconductor transition temperature T_c of greater than or equal to 26°K;

b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; ~~and~~

(c) a source of an electric current to flow in the superconductor element, and

(d) said superconductive composition comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements

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CLAIM 290 (Currently Amended) An ~~apparatus according to claim 289 in which~~

An apparatus for causing electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a substantially layered perovskite crystal structure, the composition comprising a superconductor transition temperature T_c of greater than or equal to 26°K;

b) a temperature controller capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition;

(c) a source capable of providing an electric current to flow in the superconductor element, and

the copper-oxide compound of the superconductive composition includes at least one element selected from the group consisting of a rare-earth element and a Group III B element and at least one alkaline-earth element.

CLAIM 291 (Previously Presented) An apparatus according to claim 290 in which the rare-earth or element is lanthanum.

CLAIM 292 (Previously Presented) An apparatus according to claim 290 in which the alkaline-earth element is barium.

CLAIM 293 (Previously Presented) An apparatus according to claim 289 in which the copper-oxide compound of the superconductive composition includes mixed valent copper ions.

CLAIM 294 (Previously Presented) An apparatus according to claim 293 in which the copper-oxide compound includes at least one element in a nonstoichiometric atomic proportion.

CLAIM 295 (Previously Presented) An apparatus according to claim 294 in which oxygen is present in the copper-oxide compound in a nonstoichiometric atomic proportion.

CLAIM 296 (Currently Amended) An apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a substantially layered perovskite crystal structure, the copper-oxide compound including at least one element selected from the group consisting of a rare-earth element and a Group III B element and at least one alkaline-earth element, the composition comprising a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a source capable of providing an electric current to flow in the superconductor element.

CLAIM 297 (Allowed) An apparatus according to claim 296 in which said at least one element is lanthanum.

CLAIM 298 (Allowed) An apparatus according to claim 296 in which the alkaline-earth element is barium.

CLAIM 299 (Allowed) An apparatus according to claim 296 in which the copper-oxide compound of the superconductive composition includes mixed valent copper ions.

CLAIM 300 (Allowed) An apparatus according to claim 299 in which the copper-oxide compound includes at least one element in a nonstoichiometric atomic proportion.

CLAIM 301 (Allowed) An apparatus according to claim 300 in which oxygen is present in the copper-oxide compound in a nonstoichiometric atomic proportion.

CLAIM 302 (Currently Amended) An apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a substantially layered perovskite crystal structure, the composition comprising a superconductive transition temperature T_c of greater than or equal to 26°K, said superconductive composition includes at least one element selected from the group consisting of a Group II A element, a rare earth element; and a Group III B element;

(b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a source capable of providing an electric current to flow in the superconductor element.

CLAIM 303 (Currently Amended) An apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a substantially layered perovskite crystal structure, the copper-oxide compound including at least one element selected from the group consisting of a Group II A element, a rare earth element and a Group III B element, the composition comprising a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and
(c) a source capable of providing an electric current to flow in the superconductor element.

CLAIM 304 (Currently Amended) An apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a substantially layered perovskite crystal structure, the composition comprising a superconductive transition temperature T_c of greater than or equal to 26°K, said superconductive composition includes at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element;

(b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a source capable of providing an electric current to flow in the superconductor element.

CLAIM 305 (Currently Amended) An apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a substantially layered perovskite crystal structure, the copper-oxide compound including at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element, the composition comprising a superconductive/resistive transition defining a superconductive-resistive-transition temperature range between an upper limit defined by a transition-onset temperature Tc and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a source capable of providing an electric current to flow in the superconductor element.

CLAIM 306 (Currently Amended) An apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a transition metal oxide compound comprising a substantially layered perovskite crystal structure, the composition comprising a superconductive transition temperature T_c of greater than or equal to 26°K, said superconductive composition includes at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element;

(b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition T_c of the superconductive composition; and

(c) a source capable of providing an electric current to flow in the superconductor element.

CLAIM 307 (Currently Amended) An apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a transition metal-oxide compound comprising a substantially layered perovskite crystal structure, the transition metal-oxide compound including at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element, the composition comprising a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a source capable of providing ~~providing~~ an electric current to flow in the superconductor element.

CLAIM 308 (Previously Presented) An apparatus according to claim 273 wherein said composition comprises a substantially layered perovskite crystal structure.

CLAIM 309 (Currently Amended) An apparatus according to claim 274 wherein said superconducting ~~transistor~~ transition metal oxide comprises a substantially layered perovskite crystal structure.

CLAIM 310 (Previously Presented) An apparatus according to claim 275 wherein said superconducting copper oxide comprises a substantially layered perovskite crystal structure.

CLAIM 311 (Allowed) An apparatus according to claim 276 wherein said superconducting oxide composition comprises a substantially layered perovskite crystal structure.

CLAIM 312 (Allowed) An apparatus according to claim 277 wherein said superconducting oxide composition comprises a substantially layered perovskite crystal structure.

CLAIM 313 (Currently Amended) An apparatus according to claim 278 wherein said ~~transistor~~ transition metal oxide comprises a substantially layered perovskite crystal structure.

CLAIM 314 (Previously Presented) An apparatus according to claim 279 wherein said copper oxide comprises a substantially layered perovskite crystal structure.

CLAIM 315 (Allowed) An apparatus according to claim 280 wherein said composition comprises a substantially layered perovskite crystal structure.

CLAIM 316 (Allowed) An apparatus according to claim 281 wherein said composition of matter comprises a substantially layered perovskite crystal structure.

CLAIM 317 (Allowed) An apparatus according to claim 282 wherein said composition of matter comprises substantially layered perovskite crystal structure.

CLAIM 318 (Allowed) An apparatus according to claim 283 wherein said composition of matter comprises a substantially layered perovskite crystal structure.

CLAIM 319 (Allowed) An apparatus according to claim 284 wherein said composition of matter comprises substantially layered perovskite crystal structure.

CLAIM 320 (Currently Amended) An apparatus according to claim 285 wherein said ~~transistor~~ transition metal oxide comprises substantially layered perovskite crystal structure.

CLAIM 321 (Previously Presented) An apparatus according to claim 286 wherein said copper oxide composition comprises substantially layered perovskite crystal structure.

CLAIM 322 (Currently Amended) A superconductive combination according to ~~anyone~~ any one of claims 84 or 85, wherein said mixed transition metal oxide can be made according to known principles of ceramic science.

CLAIM 323 (Currently Amended) An apparatus according to anyone any one of claims 86, 87, 144, 146, 147, 163, 164, 168, 169, 173, 174, 178, 182, 189, 196, 197, 214, 224,

235, 236, 237, 239, 254, 255, 259, 260, 264, 265 or 273, wherein said composition can be made according to known principles of ceramic science.

CLAIM 324 (Currently Amended) A combination according to ~~anyone~~ any one of claims 91, 92 or 36 to 39, wherein said composition can be made according to known principles of ceramic science.

CLAIM 325 (Currently Amended) A superconductive apparatus according to ~~anyone~~ any one of claims 1 to 11, 33 to 35, 66 to 68,109, 130, 361-366 or 370, wherein said composition can be made according to known principles of ceramic science.

CLAIM 326 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 93 to 95 or 138, wherein said mixed copper oxide can be made according to known principles of ceramic science.

CLAIM 327 (Currently Amended) A combination according to ~~anyone~~ any one of claims 64 or 135, wherein said mixed copper oxide can be made according to known principles of ceramic science.

CLAIM 328 (Currently Amended) A superconductive apparatus according to ~~anyone~~ any one of claims 48 to 52, 96 to 108, 198 to 204, 371, 383 or 384, wherein said superconductive composition can be made according to known principles of ceramic science.

CLAIM 329 (Currently Amended) A superconductive combination according to ~~anyone~~ any one of claims 12 to 23, 110, 131, 132 or 367-370, wherein said superconductive composition can be made according to known principles of ceramic science.

CLAIM 330 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 185 or 220, wherein said superconductive composition can be made according to known principles of ceramic science.

CLAIM 331 (Previously Presented) A device according to claim 111, wherein said superconductive transition metal oxide can be made according to known principles of ceramic science.

CLAIM 332 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 183, 217, 218, 274 or 309, wherein said superconductive transition metal oxide can be made according to known principles of ceramic science.

CLAIM 333 (Previously Presented) A device according to claim 112, wherein said superconductive copper oxide can be made according to known principles of ceramic science.

CLAIM 334 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 275, 276, 310 or 311, wherein said superconductive copper oxide can be made according to known principles of ceramic science.

CLAIM 335 (Allowed) A device according to claim 113, wherein said superconductive oxide composition can be made according to known principles of ceramic science.

CLAIM 336 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 186, 221, 272, 312 or 413, wherein said superconductive oxide composition can be made according to known principles of ceramic science.

CLAIM 337 (Currently Amended) A device according to ~~anyone~~ any one of claims 114 or 117, wherein said transition metal oxide can be made according to known principles of ceramic science.

CLAIM 338 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 24 to 26, 60 to 63, 116, 141 to 143, 172, 187, 222, 232 to 234, 263, 278, 285, 287, 288,

313 or 320, wherein said transition metal oxide can be made according to known principles of ceramic science.

CLAIM 339 (Currently Amended) A superconductive apparatus according to ~~anyone~~ any one of claims 27-32, 132 or 370, wherein said transition metal oxide can be made according to known principles of ceramic science.

CLAIM 340 (Previously Presented) An invention according to claim 118, wherein said transition metal oxide can be made according to known principles of ceramic science.

CLAIM 341 (Previously Presented) A transition metal oxide device according to claim 128, wherein said transition metal oxide can be made according to known principles of ceramic science.

CLAIM 342 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 40 to 45, wherein said superconductor can be made according to known principles of ceramic science.

CLAIM 343 (Currently Amended) A device according to ~~anyone~~ any one of claims 119 or 121, wherein said copper oxide can be made according to known principles of ceramic science.

CLAIM 344 (Previously Presented) An apparatus according to claim 120, wherein said copper oxide can be made according to known principles of ceramic science.

CLAIM 345 (Previously Presented) An invention according to claim 122, wherein said copper oxide can be made according to known principles of ceramic science.

CLAIM 346 (Allowed) A superconductive apparatus according to claim 123, wherein said copper oxide can be made according to known principles of ceramic science.

CLAIM 347 (Previously Presented) A copper oxide device according to claim 129, wherein said copper oxide can be made according to known principles of ceramic science.

CLAIM 348 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 162, 167, 177, 188, 223, 253, 258, 268, 269, 270, 279 or 314, wherein said copper oxide can be made according to known principles of ceramic science.

CLAIM 349 (Previously Presented) A combination according to claim 57, wherein said superconductive oxide can be made according to known principles of ceramic science.

CLAIM 350 (Currently Amended) A combination according to ~~anyone~~ any one of claims 58 or 373, wherein said ~~copper~~ transition metal oxide conductor can be made according to known principles of ceramic science.

CLAIM 351 (Previously Presented) A combination according to claim 59, wherein said ceramic-like material can be made according to known principles of ceramic science.

CLAIM 352 (Currently Amended) A superconductive combination according to ~~anyone~~ any one of claims 69 to 71 or 134, wherein said superconductive composition can be made according to known principles of ceramic science.

CLAIM 353 (Currently Amended) A superconductive apparatus according to ~~anyone~~ any one of claims 139, 140, 149 to 155, 156 to 161, 170, 171, 175, 176, 180, 181, 205 to 216, 387-393, or 396-401, wherein said superconductive composition can be made according to known principles of ceramic science.

CLAIM 354 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 165, 166, 185, 220, 240 to 246, 247 to 252, 261, 262, 289, 290 to 301, 394, 395, 402-406, 409 or 410, wherein said superconductive composition can be made according to known principles of ceramic science.

CLAIM 355 (Currently Amended) A combination according to ~~anyone~~ any one of claims 77 to 81, 186, 379 or 380, wherein said mixed copper oxide composition can be made according to known principles of ceramic science.

CLAIM 356 (Currently Amended) A device according to ~~anyone~~ any one of claims 124 to 127, wherein said composition of matter can be made according to known principles of ceramic science.

CLAIM 357 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 190 to 194, 225 to 229, 231, 256, 257, 266, 267, 271, 272, 281 to 284, 317 to 319, 407, or 411 to 413, wherein said composition of matter can be made according to known principles of ceramic science.

CLAIM 358 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 186 or 221, wherein said superconductive oxide composition can be made according to known principles of ceramic science.

CLAIM 359 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 195 or 230, wherein said copper oxide composition can be made according to known principles of ceramic science.

CLAIM 360 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 286 or 321, wherein said copper oxide composition can be made according to known principles of ceramic science.

CLAIM 361 (Currently Amended) A superconducting apparatus comprising: a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or an element comprising a rare earth characteristic, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal

to 26°K, a ~~means~~ temperature controller ~~for~~ capable of maintaining said composition at said temperature to exhibit said superconductivity and ~~means~~ a current source ~~for~~ capable of passing an electrical superconducting current through said composition while exhibiting said superconductivity.

CLAIM 362 (Previously Presented) The superconducting apparatus of claim 361, further including an alkaline earth element substituted for at least one atom of said rare earth or element comprising a rare earth characteristic in said composition.

CLAIM 363 (Previously Presented) The superconducting apparatus of claim 362, where said rare earth or element comprising a rare earth characteristic is selected from the group consisting of La, Nd, and Ce.

CLAIM 364 (Previously Presented) The superconducting apparatus of claim 361, where said phase is crystalline with a structure comprising a perovskite characteristic.

CLAIM 365 (Previously Presented) The superconducting apparatus of claim 362, where said phase is crystalline with a structure comprising a perovskite characteristic.

CLAIM 366 (Previously Presented) The superconducting apparatus of claim 361, where said phase exhibits a crystalline structure comprising a layered characteristic.

CLAIM 367 (Previously Presented) The combination of claim 15, where said additional element is a rare earth or an element comprising a rare earth characteristic.

CLAIM 368 (Previously Presented) The combination of claim 12, where said composition includes a superconducting phase comprising a perovskite characteristic.

CLAIM 369 (Previously Presented) The combination of claim 20, where said substituted transition metal oxide has a structure comprising a layered characteristic.

CLAIM 370 (Previously Presented) The superconducting apparatus of claim 31, where said crystalline structure comprises a layered characteristic, enhancing the number of Jahn-Teller polarons in said composite.

CLAIM 371 (Previously Presented) The superconductive apparatus of claim 48, where said substitutions include a rare earth or an element comprising a rare earth characteristic.

CLAIM 372 (Currently Amended) A superconductive apparatus comprising: an element capable of carrying a superconductive current comprised of a copper oxide comprising a crystalline structure comprising a layered characteristic and at least one additional element substituted in said crystalline structure, said structure being oxygen deficient

and exhibiting a superconducting onset temperature greater than or equal to 26°K, said copper oxide comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements

CLAIM 373 (Currently Amended) A combination, comprised of:

a ~~copper~~ transition metal oxide superconductor having a superconductor onset temperature greater than about 26°K including an element which results in a mixed valent state in said oxide, said oxide being crystalline and comprising a structure comprising a layered characteristic,

~~means~~ a current source ~~for~~ capable of passing a superconducting current through said copper oxide while it is maintained at a temperature greater than or equal to 26°K and less than said superconducting onset temperature, ~~and~~

~~means~~ a temperature controller ~~for~~ capable of cooling said copper oxide to a superconductive state at a temperature greater than or equal to 26°K and less than said superconducting onset temperature

said transition metal oxide comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements

CLAIM 374 (Currently Amended) A combination, comprised of:

a material comprising a ceramic characteristic comprising an onset of superconductivity at an onset temperature greater than or equal to 26°K,

~~means~~ a current source ~~for~~ capable of passing a superconducting electrical current through said material comprising a ceramic characteristic while said material is maintained at a temperature greater than or equal to 26°K and less than said onset temperature, ~~and~~

~~means~~ a temperature controller ~~for~~ capable of cooling said superconducting material having a ceramic characteristic to a superconductive state at a temperature greater than or equal to 26°K and less than said onset temperature, said material being superconductive at temperatures below said onset temperature and a ceramic at temperatures above said onset temperature, and

said material comprising a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 375 (Currently Amended) An apparatus comprising: a composition exhibiting superconductivity at temperatures greater than or equal to 26°K, said composition being a material comprising a ceramic characteristic in the RE-AE-TM-O system, where RE is a rare earth or near rare earth element, AE is an alkaline earth element, TM is a multivalent transition metal element having at least two valence states in said composition, and O is oxygen, the ratio of the amounts of said transition metal in said two valence states being determined by the ratio RE: AE, a source of current ~~for~~ capable of passing a superconducting electric current in said transition metal oxide, and a cooling apparatus ~~for~~ capable of maintaining said transition metal oxide below said onset temperature and at a temperature greater than or equal to 26°K.

CLAIM 376 (Previously Presented) The combination of claim 71, where said mixed copper oxide further includes a rare earth or an element comprising a rare earth characteristic.

CLAIM 377 (Withdrawn, Currently Amended) An apparatus comprising: an element capable of carrying a superconductive current comprising a superconductor having a superconducting onset temperature greater than or equal to 26°K, said superconductor being made by a method including the steps of:

preparing powders of oxygen-containing compounds of a rare earth or rare earth-like element, an alkaline earth element, and copper,

mixing said compounds and firing said mixture to create a mixed copper oxide composition including said alkaline earth element and said rare earth or rare earth-like element, and

annealing said mixed copper oxide composition at an elevated temperature less than about 950°C in an atmosphere including oxygen to produce a superconducting composition having a mixed copper oxide phase exhibiting a superconducting onset temperature greater than or equal to 26°K, said superconducting composition comprising a crystalline structure comprising a layered characteristic after said annealing step.

CLAIM 378 (Withdrawn, Currently Amended) An apparatus comprising: an element capable of carrying a superconductive current comprising a superconductor having a superconducting onset temperature greater than or equal to 26°K, said superconductor being comprised of a rare earth or an element (RE) comprising a rare earth characteristic, an alkaline earth element (AE), copper (CU), and oxygen (O) and having the general formula RE-AE-CU-O, said superconductor being made by a method comprising the steps of combining said rare earth or element comprising a rare earth characteristic, said alkaline earth element and said copper in the presence of oxygen to

produce a mixed copper oxide including said rare earth or rare earth-like element and said alkaline earth element therein, and
heating said mixed copper oxide to produce a superconductor having a crystalline structure comprising a layered characteristic and exhibiting a superconducting onset temperature greater than or equal to 26°K the critical transition temperature of said superconductor being dependent on the amount of said alkaline earth element therein.

CLAIM 379 (Currently Amended) A combination, comprising:

a mixed copper oxide composition including an alkaline earth element (AE) and a rare earth or element (RE) comprising a rare earth characteristic, said composition comprising a crystalline structure comprising a layered characteristic and multi-valent oxidation states, said composition exhibiting *a* substantially zero resistance to the flow of electrical current therethrough when cooled to a superconducting state at a temperature greater than or equal to 26°K, said mixed copper oxide having a superconducting onset temperature greater than or equal to 26°K, and

~~electrical means~~ a current source ~~for~~ capable of passing an electrical superconducting current through said composition when said composition exhibits substantially zero resistance at a temperature greater than or equal to 26°K and less than said onset temperature.

CLAIM 380 (Previously Presented) The combination of claim 379, wherein said crystalline structure comprises a perovskite characteristic.

CLAIM 381 (Currently Amended) An apparatus comprising: an element capable of carrying a superconductive current comprising a superconductor having a superconducting onset temperature greater than or equal to 26°K, said superconductor being comprised of a rare earth or an element (RE) comprising a rare earth characteristic, an alkaline earth element (AE), a transition metal element (TM), and Oxygen (O) and having the general formula RE-AE-TM-O, said superconductor being

made by a method comprising the steps of combining said rare earth or element comprising a rare earth characteristic, said alkaline earth element and said transition metal element in the presence of oxygen to produce a mixed transition metal oxide including said rare earth or element comprising a rare earth characteristic and said alkaline earth element therein, and

heating said mixed transition metal oxide to produce superconductor having a crystalline structure comprising a layered characteristic and exhibiting a superconducting onset temperature greater than or equal to 26°K, said superconductor having a non-stoichiometric amount of oxygen therein.

CLAIM 382 (Previously Presented) The apparatus of claim 93, where said copper oxide material exhibits a crystalline structure comprising a layered characteristic.

CLAIM 383 (Currently Amended) A superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition comprising a ~~copper~~-transition metal oxide compound having a crystal structure comprising a perovskite characteristic and a layered characteristic, the composition having a superconductor transition temperature T_c of greater than or equal to 26°K;

(b) ~~means~~ a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; ~~and~~

(c) ~~means~~ a current source ~~for~~ capable of causing an electric current to flow in the superconductor element; and

(d) said superconductive composition comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 384 (Currently Amended) A superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition comprising a copper-transition metal oxide compound having a crystal structure comprising a perovskite characteristic and a layered characteristic, the composition having a superconductor transition temperature T_c of greater than or equal to 26°K;

(b) a temperature controller capable ofmaintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition;

(c) a current source capable of causing an electric current to flow in the superconductor element; and

(d)~~The superconductive apparatus according to claim 383 in which~~ the copper-oxide compound of the superconductive composition includes at least one rare-earth or element comprising a rare earth characteristic and at least one alkaline-earth element.

CLAIM 385 (Previously Presented) The superconductive apparatus according to claim 384 in which the rare-earth or element comprising a rare earth characteristic is lanthanum.

CLAIM 386 (Currently Amended) A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:
(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the copper-oxide compound including at least one rare-earth or element comprising a rare earth characteristic and at least one alkaline-earth element, the composition having a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{q=o}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) ~~means~~ a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature ~~$T_{q=o}$~~ $T_{p=o}$ of the superconductive composition; and

(c) ~~means~~ a current source ~~for~~ capable of causing an electric current to flow in the superconductor element.

CLAIM 387 (Allowed) The superconductive apparatus according to claim 386 in which the rare-earth or an element comprising a rare earth characteristic is lanthanum.

CLAIM 388 (Allowed) An apparatus comprising:

a composition including a transition metal, a rare earth or an element comprising a rare earth characteristic, an alkaline earth element, and oxygen, where said composition is a mixed transition metal oxide having a non-stoichiometric amount of oxygen therein and exhibiting a superconducting state at a temperature greater than or equal to 26°K.

a temperature controller capable of maintaining said composition in said superconducting state at a temperature greater than or equal to 26°K, and

a current source capable of passing an electrical current through said composition while said composition is in said superconducting state.

CLAIM 389 (Currently Amended) A superconductive apparatus for causing electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the composition having a superconductor transition temperature T_c of greater than or equal to 26°K;

(b) a temperature controller capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; ~~and~~

(c) a source capable of causing an electric current to flow in the superconductor element; and

(d) said superconductive composition comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements

CLAIM 390 (Currently Amended) A superconductive apparatus for causing electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the composition having a superconductor transition temperature T_c of greater than or equal to 26°K;

(b) a temperature controller capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition;

(c) a source capable of causing an electric current to flow in the superconductor element; and.

~~The superconductive apparatus according to claim 389 in which~~ the copper-oxide compound of the superconductive composition includes at least one rare-earth or an element comprising a rare earth characteristic and at least one alkaline-earth element.

CLAIM 391 (Allowed) The superconductive apparatus according to claim 390 in which the rare-earth or an element comprising a rare earth characteristic is lanthanum.

CLAIM 392 (Currently Amended) A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the copper-oxide compound including at least one rare-earth or rare-

earth-like element and at least one alkaline-earth element, the composition having a superconductive/resistive-transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;
(b) a temperature controller capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk- resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 393 (Allowed) The superconductive apparatus according to claim 392 in which the rare-earth or an element comprising a rare earth characteristic is lanthanum.

CLAIM 394 (Currently Amended) An apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the composition having a superconductive transition temperature T_c of greater than or equal to 26°K, said superconductive composition includes at least one element selected from the group consisting of a Group II A element, a rare earth element; and a Group III B element;

(b) a temperature controller capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 395 (Currently Amended) An apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the copper-oxide compound including at least one element selected from the group consisting of a Group II A element, a rare earth element and a Group III B element, the composition having a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk- resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 396 (Currently Amended) A superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite

characteristic, the composition having a superconductive transition temperature T_c of greater than or equal to 26°K, said superconductive composition includes at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element;

(b) a temperature controller capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 397 (Currently Amended) A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the copper-oxide compound including at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element, the composition having a superconductive/resistive transition defining a superconductive-resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk- resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 398 (Currently Amended) A superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a transition metal oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the composition having a superconductive transition temperature T_c of greater than or equal to 26°K, said superconductive composition includes an element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element;

(b) a temperature controller capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition T_c of the superconductive composition; and

(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 399 (Currently Amended) A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a transition metal-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the transition metal-oxide compound including at least one

element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element, the composition having a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk- resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 400 (Currently Amended) A superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the composition having a superconductive transition temperature T_c of greater than or equal to 26°K, said superconductive composition includes a Group II A element, and at least one element selected from the group consisting of a rare earth element and a Group III B element;

(b) a temperature controller capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 401 (Currently Amended) A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the copper-oxide compound including Group II A element, and at least one element selected from the group consisting of a rare earth element and a Group III B element, the composition having a superconductive-resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 402 (Currently Amended) An apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite

characteristic, the composition comprising a superconductor transition temperature T_c of greater than or equal to 26°K;

(b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; ~~and~~

(c) a source capable of providing an electric current to flow in the superconductor element, and

(d) said superconducting composition comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 403 (Currently Amended) A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the copper-oxide compound including Group II A element, and at least one element selected from the group consisting of a rare earth element and a Group III B element, the composition having a superconductive-resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition;

(c) a current source capable of causing an electric current to flow in the superconductor element., and

(d)~~An apparatus according to claim 402 in which~~ the copper-oxide compound of the superconductive composition includes at least one rare-earth or an element comprising a rare earth characteristic and at least one alkaline-earth element.

CLAIM 404 (Previously Presented) An apparatus according to claim 403 in which the rare-earth or element comprising a rare earth characteristic is lanthanum.

CLAIM 405 (Currently Amended) An apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a layer-type perovskite-like crystal structure, the copper-oxide compound comprising at least one rare-earth or element comprising a rare earth characteristic and at least one alkaline-earth element, the composition comprising a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a source capable of providing an electric current to flow in the superconductor element.

CLAIM 406 (Allowed) An apparatus according to claim 405 in which the rare-earth or element comprising a rare earth characteristic is lanthanum.

CLAIM 407 (Currently Amended) An apparatus capable of carrying an electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the composition comprising a superconductive transition temperature T_c of greater than or equal to 26°K, said superconductive composition includes at least one element selected from the group consisting of a Group II A element, a rare earth element; and a Group III B element;

(b) a temperature controller for capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a source capable of providing an electric current to flow in the superconductor element.

CLAIM 408 (Currently Amended) An apparatus capable of carrying an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite

characteristic, the copper-oxide compound including at least one element selected from the group consisting of a Group II A element, a rare earth element and a Group III B element, the composition comprising a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a source capable of providing an electric current to flow in the superconductor element.

CLAIM 409 (Currently Amended An apparatus capable of carrying an electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the composition comprising a superconductive transition temperature T_c of greater than or equal to 26°K, said superconductive composition includes at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element;

(b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a source capable of providing an electric current to flow in the superconductor element.

CLAIM 410 (Currently Amended) An apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the copper-oxide compound including at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element, the composition comprising a superconductive/resistive transition defining a superconductive-resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a source capable of providing an electric current to flow in the superconductor element.

CLAIM 411 (Currently Amended) An apparatus capable of carrying an electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a transition metal oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the composition comprising a superconductive transition temperature T_c of greater than or equal to 26°K, said superconductive composition includes at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element;

(b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition T_c of the superconductive composition; and

(c) a source capable of providing an electric current to flow in the superconductor element.

CLAIM 412 (Currently Amended) An apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a transition metal-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the transition metal-oxide compound including at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element, the composition comprising a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a source capable of providing an electric current to flow in the superconductor element.

CLAIM 413 (Currently Amended) An apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the copper-oxide compound including at least one element selected from the group consisting of a group II A element, at least one element selected from the group consisting of a rare earth element and at least one element selected from the group consisting of a Group III B element, the composition comprising a superconductive-resistive transition temperature defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to $26^{\circ}K$;

(b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a source capable of providing an electric current to flow in the superconductor element.

CLAIM 414 (Currently Amended) A superconducting apparatus according to ~~anyone~~ any one of claims 361-365 or 366, wherein said composition can be made according to known principles of ceramic science.

CLAIM 415 (Currently Amended) A superconducting combination according to ~~anyone~~ any one of claims 367, 368 or 369, wherein said composition can be made according to known principles of ceramic science.

CLAIM 416 (Currently Amended) A superconducting apparatus according to ~~anyone~~ any one of claims 370 or 371, wherein said composition can be made according to known principles of ceramic science.

CLAIM 417 (Previously Presented) A superconducting apparatus according to claim 372, wherein said copper oxide can be made according to known principles of ceramic science.

CLAIM 418 (Previously Presented) A combination according to claim 373, wherein said copper oxide can be made according to known principles of ceramic science.

CLAIM 419 (Previously Presented) A combination according to claim 374, wherein said material can be made by known principles of ceramic science.

CLAIM 420 (Currently Amended) ~~A apparatus~~ An apparatus according to claim 375, wherein said composition can be made by known principles of ceramic science.

CLAIM 421 (Previously Presented) A combination according to claim 376, wherein said mixed copper oxide can be made by known principles of ceramic science.

CLAIM 422 (Currently Amended) A combination according to ~~anyone~~ any one of claims 379 or 380, wherein said mixed copper oxide can be made by known principles of ceramic science.

CLAIM 423 (Currently Amended) ~~A~~ An apparatus according to claim 382, wherein said copper oxide material can be made by known principles of ceramic science.

CLAIM 424 (Currently Amended) A superconductive apparatus according to ~~anyone~~ any one of claims 383, 384, 385, 386, 387 and 389, wherein said composition can be made by known principles of ceramic science.

CLAIM 425 (Currently Amended) [[A]] An apparatus according to claim 388, wherein said composition can be made according to known principles of ceramic science.

CLAIM 426 (Currently Amended) A superconductive apparatus according to ~~anyone~~ any one of claims 389 to 400 or 401, wherein said superconductive composition can be made by known principles of ceramic science.

CLAIM 427 (Currently Amended) ~~A~~ An apparatus according to ~~anyone~~ any one of claims 402 to 412 or 413, wherein said superconductive composition can be made by known principles of ceramic science.

CLAIM 428 (Currently Amended) An apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

a superconductive element capable of carrying a superconductive current comprising a superconductive composition, said superconductive composition comprising a transition metal, O and at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu; and

said composition comprising a superconductor transition temperature T_c of greater than or equal to 26°K.

CLAIM 429 (Currently Amended) An apparatus according to claim 428, further including:

a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

a source capable of providing an electric current to flow in the superconductor element.

CLAIM 430 (Previously Presented) An apparatus according to claim 428, wherein said composition comprises a substantially layered structure.

CLAIM 431 (Previously Presented) An apparatus according to claim 429, wherein said composition comprises a substantially layered structure.

CLAIM 432 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 428 to 430 or 431, wherein said composition comprises a substantially perovskite crystal structure.

CLAIM 433 (Previously Presented) An apparatus according to any one of claims 428 to 430 or 431, wherein said composition comprises a perovskite-like structure.

CLAIM 434 (Previously Presented) An apparatus according to any one of claims 428 to 430 or 431, wherein said composition comprises a perovskite characteristic.

CLAIM 435 (Previously Presented) An apparatus according to any one of claims 428 to 430 or 431, wherein said composition comprises a perovskite related structure.

CLAIM 436 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 428 to 431 or 432, wherein said composition can be made according to known principals of ceramic science.

CLAIM 437 (Currently Amended) An apparatus according to claim 88 wherein said composition is ~~an oxide~~ layered.

CLAIM 438 (Currently Amended) An apparatus comprising: a ~~means~~ a superconductive element for conducting a superconducting current at a temperature greater than or equal to 26°K and a ~~means~~ current source for providing an electric current to flow in said means for conducting a superconducting current, and said superconducting element comprising a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 439 (Previously Presented) An apparatus according to claim 438, wherein said ~~means~~ superconductive element for conducting a superconductive current comprises a T_c greater than or equal to 26°K.

CLAIM 440 (Currently Amended) An apparatus according to claim 438, further including a temperature controller ~~for~~ capable of maintaining said means for conducting a superconducting current at a said temperature.

CLAIM 441 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 438, 439 or 440, wherein said ~~means~~ superconductive element for conducting a superconducting current comprises ~~oxygen~~ a multiphase material comprising least one superconducting phase.

CLAIM 442 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 438, 439 and 440, wherein said ~~means~~ superconductive element for conducting a superconducting current comprises one or more of the groups consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

CLAIM 443 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 438, 439 or 440, wherein said ~~means~~ superconductive element for conducting a superconducting current comprises one or more of Be, Mg, Ca, Sr, Ba and Ra and one or more of Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

CLAIM 444 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 438, 439 and 440, wherein said ~~means~~ superconductive element for conducting a superconducting current comprises a layered structure.

CLAIM 445 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 438, 439 and 440, wherein said ~~means~~ superconductive element for conducting a superconducting current comprises a substantially perovskite structure.

CLAIM 446 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 438, 439 and 440, wherein said ~~means~~ superconductive element for conducting a superconducting current comprises a perovskite-like structure.

CLAIM 447 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 438, 439 and 440, wherein ~~means~~ superconductive element for conducting a superconducting current comprises a perovskite related structure.

CLAIM 448 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 438, 439 and 440, wherein said ~~means~~ superconductive element for conducting a superconducting current comprises a structure having a perovskite characteristic.

CLAIM 449 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 438, 439 and 440, wherein said ~~means~~ superconductive element for conducting a superconducting current comprises a transition metal.

CLAIM 450 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 438, 439 and 440, wherein said ~~means~~ superconductive element for conducting a superconducting current comprises a copper oxide.

CLAIM 451 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 438, 439 and 440, wherein said ~~means~~ superconductive element for conducting a superconducting current comprises oxygen in a nonstoichiomeric amount.

CLAIM 452 (Curretnly Amended) An apparatus according to ~~anyone~~ any one of claims 438, 439 and 440, wherein said ~~means~~ superconductive element for conducting a superconducting current comprises a multivalent transition metal.

CLAIM 453 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 438, 439 or 440, wherein said ~~means~~ superconductive element for conducting a superconducting current can be made according to known principles of ceramic science.

CLAIM 454 (Currently Amended) An apparatus according to claim 441, wherein said ~~means~~ superconductive element for conducting a superconducting current can be made according to known principles of ceramic science.

CLAIM 455 (Currently Amended) An apparatus according to claim 442, wherein said ~~means~~ superconductive element for conducting a superconducting current can be made according to known principles of ceramic science.

CLAIM 456 (Currently Amended) An apparatus according to claim 443, wherein said ~~means~~ superconductive element for conducting a superconducting current can be made according to known principles of ceramic science.

CLAIM 457 (Currently Amended) An apparatus according to claim 444, wherein said ~~means~~ superconductive element for conducting a superconducting current can be made according to known principles of ceramic science.

CLAIM 458 (Currently Amended) An apparatus according to claim 445, wherein said ~~means~~ superconductive element for conducting a superconducting current can be made according to known principles of ceramic science.

CLAIM 459 (Currently Amended) An apparatus according to claim 446, wherein said ~~means~~ superconductive element for conducting a superconducting current can be made according to known principles of ceramic science.

CLAIM 460 (Currently Amended) An apparatus according to claim 447, wherein said ~~means~~ superconductive element for conducting a superconducting current can be made according to known principles of ceramic science.

CLAIM 461 (Currently Amended) An apparatus according to claim 448, wherein said ~~means~~ superconductive element for conducting a superconducting current can be made according to known principles of ceramic science.

CLAIM 462 (Currently Amended) An apparatus according to claim 449, wherein said ~~means~~ superconductive element for conducting a superconducting current can be made according to known principles of ceramic science.

CLAIM 463 (Currently Amended) An apparatus according to claim 450, wherein said ~~means~~ superconductive element for conducting a superconducting current can be made according to known principles of ceramic science.

CLAIM 464 (Currently Amended) An apparatus according to claim 451, wherein said ~~means~~ superconductive element for conducting a superconducting current can be made according to known principles of ceramic science.

CLAIM 465 (Currently Amended) An apparatus according to claim 452, wherein said ~~means~~ superconductive element for conducting a superconducting current can be made according to known principles of ceramic science.

CLAIM 466 (Currently Amended) An apparatus comprising:

a superconductive ~~current carrying~~ element capable of carrying a superconductive current comprising a ~~T_c m 26âK~~ T_c greater than or equal to 26°K;

said superconductive ~~current carrying~~ element comprises a property selected from one or more of the group consisting of a mixed valent oxide, a transition metal, a mixed valent transition metal, a perovskite structure, a perovskite-like structure, a perovskite related structure, a layered structure, a stoichiomeric or nonstoichiomeric oxygen contents and a dopant, and

said said superconductive element comprising a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements..

CLAIM 467 (Currently Amended) An apparatus according to claim 466, wherein said superconductive ~~current carrying~~ element is at a temperature greater than or equal to ~~26âK~~ 26°K.

CLAIM 468 (Currently Amended) An apparatus according to claim 466, further including a temperature controller ~~for~~ capable of maintaining said superconductive ~~current carrying~~ element at a temperature less than said T_c.

CLAIM 469 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 466, 467 or 468, wherein said superconductive ~~current-carrying~~ element comprises one or more of the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

CLAIM 470 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 466, 467 or 468, wherein said superconductive ~~current-carrying~~ element comprises one or more of Be, Mg, Ca, Sr, Ba and Ra and one or more of Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

CLAIM 471 (Currently Amended) An apparatus according to claim 469, wherein said superconductive ~~current-carrying~~ element comprises a ~~transition-metal~~ copper.

CLAIM 472 (Currently Amended) An apparatus according to claim 470, wherein said superconductive ~~current-carrying~~ element comprises ~~a transition-metal~~ copper

CLAIM 473 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 466, 467, or 468, wherein said ~~superconducting~~ superconductive ~~current-carrying~~ element can be made according to known principles of ceramic science.

CLAIM 474 (Currently Amended) An apparatus according to of claim 471, wherein said ~~superconducting~~ superconductive ~~current-carrying~~ element can be made according to known principles of ceramic science.

CLAIM 475 (Currently Amended) An apparatus according to of claim 472, wherein said ~~superconducting~~ superconductive ~~current-carrying~~ element can be made according to known principles of ceramic science.

CLAIM 476 (Currently Amended) An apparatus comprising:

a superconductive ~~current-carrying~~ element capable of carrying a supercondcutive current comprising a ~~T_c m 26âK~~ T_c greater than or equal to 26°K;

said superconductive ~~current-carrying~~ element comprises ~~an~~ transition metal oxide, a layered perovskite structure or a layered perovskite-like structure and comprises a stoichiomeric or nonstoichiomeric oxygen content and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 477 (Currently Amended) An apparatus according to claim 476, wherein said superconductive ~~current-carrying~~ element is at a temperature greater than or equal to ~~26âK~~ 26°K.

CLAIM 478 (Currently Amended) An apparatus according to claim 476, further including a temperature controller ~~for~~ capable of maintaining said superconductive ~~current-carrying~~ element at a temperature less than said T_c.

CLAIM 479 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 476, 477 or 478, wherein said superconductive ~~current-carrying~~ element comprises one or more of the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

CLAIM 480 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 476, 477 or 478, wherein said superconductive ~~current-carrying~~ element comprises one or more of Be, Mg, Ca, Sr, Ba and Ra and one or more of Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

CLAIM 481 (Currently Amended) An apparatus according to claim 479, wherein said superconductive ~~current-carrying~~ element comprises a ~~transition metal~~ multiphase material comprising a superconductive phase.

CLAIM 482 (Currently Amended) An apparatus according to claim 480, wherein said superconductive ~~current-carrying~~ element comprises ~~a transition metal~~ multiphase material comprising a superconductive phase.

CLAIM 483 (Currently Amended) An apparatus according to claim 476, wherein said superconductive ~~current-carrying~~ element comprises copper oxide.

CLAIM 484 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 476, 477 or 478, wherein said superconductive ~~current-carrying~~ element can be made according to known principles of ceramic science.

CLAIM 485 (Currently Amended) An apparatus according to claim 479, wherein said superconductive ~~current-carrying~~ element can be made according to known principles of ceramic science.

CLAIM 486 (Currently Amended) An apparatus according to claim 480, wherein said superconductive ~~current-carrying~~ element can be made according to known principles of ceramic science.

CLAIM 487 (Currently Amended) An apparatus according to claim 481, wherein said superconductive ~~current-carrying~~ element can be made according to known principles of ceramic science.

CLAIM 488 (Currently Amended) An apparatus according to claim 482, wherein said superconductive ~~current-carrying~~ element can be made according to known principles of ceramic science.

CLAIM 489 (Currently Amended) An apparatus according to claim 483, wherein said superconductive ~~current-carrying~~ element can be made according to known principles of ceramic science.

CLAIM 490 (Currently Amended) An apparatus according to claim 484, wherein said superconductive ~~current-carrying~~ element can be made according to known principles of ceramic science.

CLAIM 491 (Currently Amended) An apparatus according to claim 485, wherein said superconductive ~~current-carrying~~ element can be made according to known principles of ceramic science.

CLAIM 492 (Previously Presented) The superconducting apparatus of claim 361, where said phase is crystalline with a structure comprising a perovskite related structure.

CLAIM 493 (Previously Presented) The superconducting apparatus of claim 362, where said phase is crystalline with a structure comprising a perovskite related structure.

CLAIM 494 (Previously Presented) The combination of claim 12, where said composition includes a superconducting phase comprising a perovskite related structure.

CLAIM 495 (Previously Presented) The combination of claim 379, wherein said crystalline structure comprises a perovskite related structure.

CLAIM 496 (Currently Amended) A superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition comprising a copper-oxide compound having a crystal

structure comprising a perovskite related structure and a layered characteristic, the composition having a superconductor transition temperature T_c of greater than or equal to 26°K;

(b) ~~means~~ a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; ~~and~~

(c) ~~means~~ a current source ~~for~~ capable of causing an electric current to flow in the superconductor element; and

(d) said superconductive composition comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 497 (Currently Amended) A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite related structure, the copper-oxide compound including at least one rare-earth or element comprising a rare earth characteristic and at least one alkaline-earth element, the composition having a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{q=o}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) ~~means~~ a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{q=0}$ of the superconductive composition; and

(c) ~~means~~ a current source ~~for~~ capable of causing an electric current to flow in the superconductor element.

CLAIM 498 (Currently Amended) A superconductive apparatus for causing electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite related structure, the composition having a superconductor transition temperature T_c of greater than or equal to 26°K;

(b) a temperature controller capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; ~~and~~

(c) a source capable of causing an electric current to flow in the superconductor element; and

(d) said superconductive composition comprising at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 499 (Currently Amended) A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite related structure, the copper-oxide compound including at least one rare-earth or rare-earth-like element and at least one alkaline-earth element, the composition having a superconductive/resistive-transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk- resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 500 (Currently Amended) An apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite related structure, the composition having a superconductive transition temperature T_c of greater than or equal to 26°K, said superconductive composition includes at least one element selected from the group consisting of a Group II A element, a rare earth element; and a Group III B element;

(b) a temperature controller capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 501 (Currently Amended) An apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite related structure, the copper-oxide compound including at least one element selected from the group consisting of a Group II A element, a rare earth element and a Group III B element, the composition having a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk- resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 502 (Currently Amended) A superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite related structure, the composition having a superconductive transition temperature T_c of greater than or equal to 26°K, said superconductive composition includes at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element;

(b) a temperature controller capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 503 (Currently Amended) A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the uperconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite related structure, the copper-oxide compound including at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element, the composition having a superconductive/resistive transition defining a superconductive-resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk- resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 504 (Currently Amended) A superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a transition metal oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite related structure, the composition having a superconductive transition temperature T_c of greater than or equal to 26°K, said superconductive composition includes an element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element;

(b) a temperature controller capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition T_c of the superconductive composition; and

(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 505 (Currently Amended) A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a transition metal-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite related structure, the transition metal-oxide compound including at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element, the composition having a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk- resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 506 (Currently Amended) A superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite related structure, the composition having a superconductive transition temperature T_c of greater than or equal to 26°K, said superconductive composition includes a Group II A element, and at least one element selected from the group consisting of a rare earth element and a Group III B element;

(b) a temperature controller capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 507 (Currently Amended) A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite related structure, the copper-oxide compound including Group II A element, and at least one element selected from the group consisting of a rare earth element and a Group III B element, the composition having a superconductive-resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a current source capable of causing an electric current to flow in the superconductor element.

CLAIM 508 (Currently Amended) An apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite related structure, the composition comprising a superconductor transition temperature T_c of greater than or equal to 26°K;

(b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; ~~and~~

(c) a source capable of providing an electric current to flow in the superconductor element, and

(d) said superconductive composition comprising a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements..

CLAIM 509 (Currently Amended) An apparatus capable of carrying an electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite related structure, the composition comprising a superconductive transition temperature T_c of greater than or equal to 26°K, said superconductive composition includes at least one element selected from the group consisting of a Group II A element, a rare earth element; and a Group III B element;

(b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a source capable of providing an electric current to flow in the superconductor element.

CLAIM 510 (Currently Amended) An apparatus capable of carrying an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite related structure, the copper-oxide compound including at least one element selected from the group consisting of a Group II A element, a rare earth element and a Group III B element, the composition comprising a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a source capable of providing an electric current to flow in the superconductor element.

CLAIM 511 (Currently Amended) An apparatus capable of carrying an electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite related structure, the composition comprising a superconductive transition temperature T_c of greater than or equal to 26°K, said superconductive composition includes at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element;

(b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature T_c of the superconductive composition; and

(c) a source capable of providing an electric current to flow in the superconductor element.

CLAIM 512 (Currently Amended) An apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite related structure, the copper-oxide compound including at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element, the composition comprising a superconductive/resistive transition defining a superconductive-resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a source capable of providing an electric current to flow in the superconductor element.

CLAIM 513 (Currently Amended) An apparatus capable of carrying an electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a transition metal oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite related structure, the composition comprising a superconductive transition temperature T_c of greater than or equal to 26°K, said superconductive composition includes at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element;

(b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition T_c of the superconductive composition; and

(c) a source capable of providing an electric current to flow in the superconductor element.

CLAIM 514 (Currently Amended) An apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a transition metal-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite related structure, the transition metal-oxide compound including at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element, the composition comprising a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller for capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a source capable of providing an electric current to flow in the superconductor element.

CLAIM 515 (Currently Amended) An apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite related structure, the copper-oxide compound including at least one element selected from the group consisting of a group II A element, at least one element selected from the group consisting of a rare earth element and at least one element selected from the group consisting of a Group III B element, the composition comprising a superconductive-resistive transition temperature defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset

temperature T_c and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$, the transition-onset temperature T_c being greater than or equal to 26°K;

(b) a temperature controller ~~for~~ capable of maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature $T_{\rho=0}$ of the superconductive composition; and

(c) a source capable of providing an electric current to flow in the superconductor element.

CLAIM 516 (Currently Amended) An apparatus of claim 146 wherein said ~~means for carrying a superconductive current is comprised of an oxide~~ composition comprises a multiphase material comprising a superconductive phase .

CLAIM 517 (Currently Amended) An apparatus comprising:

a superconductive ~~current carrying~~ element capable of carrying a superconductive current comprising a ~~T_c m 26âK~~
T_c greater than or equal to 26°K;

said superconductive ~~current carrying~~ element comprises a metallic, oxygen-deficient, perovskite-like, mixed valent copper compound, said compound comprising a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements..

CLAIM 518 (Currently Amended) An apparatus according to claim 517, wherein said superconductive ~~current-carrying~~ element is at a temperature greater than or equal to ~~26âK~~ to 26°K.

CLAIM 519 (Currently Amended) An apparatus according to claim 517, further including a temperature controller ~~for~~ capable of maintaining said superconductive ~~current-carrying~~ element at a temperature less than said T_c.

CLAIM 520 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 517, 518 or 519, wherein said superconductive ~~current-carrying~~ element comprises one or more of the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho Er, Tm, Yb and Lu.

CLAIM 521 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 517, 518 or 519, wherein said superconductive ~~current-carrying~~ element comprises one or more of Be, Mg, Ca, Sr, Ba and Ra and one or more of Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

CLAIM 522 (Currently Amended) An apparatus comprising:

a superconductive ~~current-carrying~~ element capable of carrying a superconductive current comprising a ~~T_c m 26âK~~ T_c greater than or equal to 26°K;

said superconductive ~~current-carrying~~ element comprises a composition that can be made according to known principles of ceramic science, and
said composition comprising a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 523 (Currently Amended) An apparatus according to claim 522, wherein said superconductive ~~current-carrying~~ element is at a temperature greater than or equal to ~~26âK~~ 26°K.

CLAIM 524 (Currently Amended) An apparatus according to claim 523, further including a temperature controller ~~for~~ capable of maintaining said superconductive ~~current-carrying~~ element at a temperature less than said T_c.

CLAIM 525 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 522, 523 or 524, wherein said superconductive ~~current-carrying~~ element comprises one or more of the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

CLAIM 526 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 522, 523 or 524, wherein said superconductive ~~current-carrying~~ element comprises one or more of Be, Mg, Ca, Sr, Ba and Ra and one or more of Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

CLAIM 527 (Currently Amended) An apparatus according to claim 525, wherein said superconductive ~~current-carrying~~ element comprises ~~a transition metal~~ a multiphase material comprising a supercondcutive phase.

CLAIM 528 (Currently Amended) An apparatus according to claim 526, wherein said superconductive ~~current-carrying~~ element comprises ~~a transition metal~~ a multiphase material comprising a supercondcutive phase.

CLAIM 529 (Currently Amended) An apparatus according to claim 522, wherein said superconductive ~~current-carrying~~ element comprises copper oxide.

CLAIM 530 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 522, 523 or 524, wherein said superconductive ~~current-carrying~~ element is substantially perovskite.

CLAIM 531 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 522, 523 or 524, wherein said superconductive ~~current-carrying~~ element comprises a perovskite-like structure.

CLAIM 532 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 522, 523 or 524, wherein said superconductive ~~current-carrying~~ element comprises a perovskite related structure.

CLAIM 533 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 522, 523 or 524, wherein said superconductive ~~current-carrying~~ element comprises a nonstoichiometric amount of oxygen.

CLAIM 534 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 522, 523 or 524, wherein said superconductive ~~current-carrying~~ element comprises a layered structure.

CLAIM 535 (Currently Amended) An apparatus comprising: a superconductor exhibiting a superconducting onset at an onset temperature greater than or equal to 26°K, said superconductor being comprised of at least four elements, none of which is a means for carrying a superconducting current at a temperature greater than or equal to 26°K, ~~means~~ a temperature controller ~~for~~ capable of maintaining said superconductor at an operating temperature in excess of said onset temperature to maintain said superconductor in a superconducting state and ~~means~~ a current source ~~for~~ capable of passing current through said superconductor while in said superconducting state, said superconductor comprises a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements,

rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 536 (Currently Amended) An apparatus comprising:

a ~~means~~ component for carrying a superconductive current exhibiting a superconductive state at a temperature greater than or equal to 26°K,

a cooler ~~for~~ capable of cooling said composition to a temperature greater than or equal to 26°K at which temperature said means for carrying a superconductive current exhibits said superconductive state, ~~and~~

a current source ~~for~~ capable of passing an electrical current through said composition while said composition is in said superconductive state; and

said component comprising a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 537 (Currently Amended) An apparatus comprising:

a metallic, oxygen-deficient, perovskite-like, mixed valent transition metal composition exhibiting a superconductive state at a temperature greater than or equal to 26°K,

a temperature controller capable of maintaining said composition at a temperature greater than or equal to 26°K at which temperature said composition exhibits said superconductive state, ~~and~~

a current source capable of passing an electrical current through said composition while said composition is in said superconductive state; and

said metallic, oxygen-deficient, perovskite-like, mixed valent transition metal composition comprising a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 538 (Currently Amended) The apparatus of claim 537, where said ~~means for carrying a superconductive current~~ metallic, oxygen-deficient, perovskite-like, mixed valent transition metal composition is ~~comprised of a metal oxide~~ layered.

CLAIM 539 (Currently Amended) The apparatus of claim 537, where said ~~means for carrying a superconductive current~~ metallic, oxygen-deficient, perovskite-like, mixed valent transition metal composition is comprised of ~~a transition metal oxide~~ a multiphase material comprising a superconductive phase.

CLAIM 540 (Currently Amended) An apparatus comprising:

a composition comprising oxygen exhibiting a superconductive state at a temperature greater than or equal to 26°K, a temperature controller ~~for~~ capable of maintaining said composition at a temperature greater than or equal to 26°K at which temperature said composition exhibits said superconductive state, ~~and~~

a source capable of providing an electrical current through said composition while said composition is in said superconductive state; and

said composition comprising a transition metal and at least one element selected from the group consisting of a first element group, a second element group and combinations

thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 541 (Currently Amended) An apparatus according to claim 540, where said composition is ~~comprised of a metal oxide~~ layered.

CLAIM 542 (Currently Amended) An apparatus according to claim 541, where said composition is comprised of of ~~a transition metal oxide~~ at least on e superconductive phase.

CLAIM 543 (Currently Amended) A combination, comprising:

an oxygen containing composition exhibiting the onset of a DC substantially zero resistance state at an onset temperature in excess of 30°K, ~~and~~

~~means~~ a current source ~~for~~ capable of passing an electrical current through said composition while it is in said substantially zero resistance state; and

said composition further comprising a transition metal, and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof, wherein said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements and said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 544 (Previously Presented) An apparatus according to claim 535, wherein said superconductor can be made according to known principles of ceramic science.

CLAIM 545 (Previously Presented) An apparatus according to claim 536, wherein said means for carrying a superconductive current can be made according to known principles of ceramic science.

CLAIM 546 (Previously Presented) An apparatus according to any one of claims 537, 538 or 539 wherein said composition can be made according to known principles of ceramic science.

CLAIM 547 (Previously Presented) An apparatus according to any one of claims 540, 541 or 542 wherein said composition can be made according to known principles of ceramic science.

CLAIM 548 (Previously Presented) A combination according to claim 543, wherein said composition can be made according to known principles of ceramic science.

CLAIM 549 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 496 to 514 or 515, wherein said superconductive element can be made according to known principles of ceramic science.

CLAIM 550 (Previously Presented) An apparatus according to claim 516, wherein said means for carrying a superconductive current can be made according to known principles of ceramic science.

CLAIM 551 (Currently Amended) An apparatus according to ~~anyone~~ any one of claims 517 to 520 or 521, wherein said superconductive ~~current-carrying~~ element can be made according to known principles of ceramic science.

CLAIM 552 (New) An apparatus comprising:

a composition comprising a transition metal, oxygen and any element selected from the group consisting of a Group II A element, a rare earth element and a Group III B element, where said composition is a mixed copper oxide having a non-stoichiometric amount of oxygen therein and exhibiting a superconducting state at a temperature greater than or equal to 26°K;

a temperature controller capable of maintaining said composition in said superconducting state at a temperature greater than or equal to 26°K; and

a current source capable of passing an electrical current through said composition while said composition is in said superconducting state.

CLAIM 553 (New). An apparatus comprising:

a composition comprising a transition metal, oxygen and (1) a rare earth element or a rare earth-like element or a group III B element, and/or (2) an alkaline earth element or a Group IIA element, where said composition exhibits a superconducting state at a temperature greater than or equal to 26°K;

a temperature controller capable of maintaining said composition in said superconducting state at a temperature greater than or equal to 26°K; and

a current source capable of passing an electrical current through said composition while said composition is in said superconducting state.

CLAIM 554 (New) A combination according to claim 58 wherein said transition metal is copper.

CLAIM 555 (New) A combination according to claim 58 wherein said transition metal oxide is copper oxide.

CLAIM 556 (New) An apparatus according to claim 94 wherein said transition metal oxide is copper oxide.

CLAIM 557 (New) An apparatus according to claim 95 wherein said transition metal oxide is copper oxide.

CLAIM 558 (New) An apparatus according to claim 96 wherein said transition metal oxide is copper oxide.

CLAIM 559 (New) A device according to claim 112 wherein said transition metal is copper.

CLAIM 560 (New) A superconductive apparatus according to claim 139 wherein said transition metal is copper.

CLAIM 561 (New) A structure comprising:

a circuit comprising a circuit element comprising a material comprising a T_c greater than or equal to 26°K capable of carrying a superconducting current;

said material comprises a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof;

said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements, and

said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 562 (New) An structure according to claim 561 further including a temperature controller capable of maintaining said material at a temperature less than or equal to said to said T_C.

CLAIM 563 (New) A structure according to claim 561 further including a current source capable of providing said superconducting current.

CLAIM 564 (New) A structure according to claim 562 further including a current source capable of providing said superconducting current.

CLAIM 565 (New) A structure according to claim 561 wherein said material is capable of being at a temperature less than or equal to said T_C and greater than or equal to 26°K.

CLAIM 566 (New) A structure according to claim 562 wherein said material is capable of being at a temperature less than or equal to said T_C and greater than or equal to 26°K.

CLAIM 567 (New) A structure according to claim 563 wherein said material is capable of being at a temperature less than or equal to said T_C and greater than or equal to 26°K.

CLAIM 568 (New) A structure according to claim 564 wherein said material is capable of being at a temperature less than equal to said T_C and greater than or equal to 26°K.

CLAIM 569 (New) A structure according to claim 561 wherein said material comprises at least one phase which comprises a property selected from the group consisting of:

a layered structure,

a layered crystalline structure,

a substantially layered structure,

a substantially layered crystalline structure,

a layered-like structure,

a layered-type structure,

a layered characteristic,

a layered perovskite structure,

a layered perovskite crystal structure,

a substantially layered perovskite structure,

a substantially layered perovskite crystal structure,

a perovskite structure,

a substantially perovskite structure,

a perovskite-like structure,

a perovskite type structure,

a structure comprising a perovskite characteristic,

a perovskite related structure,

a crystalline structure,

a layer-like crystalline structure,

a structure which is structurally substantially similar to an orthorhombic-tetragonal phase of said material,

a crystalline structure which enhances electron-phonon interactions to produce superconductivity,

a structure enhancing the number of Jahn-Teller polarons in said material,

a distorted crystalline structure characterized by an oxygen deficiency,

a structure comprising enhanced polaron formation,

a ceramic material,

a ceramic-like material,

a ceramic characteristic,

a ceramic type material,

a stoiciomeric oxygen content,

a non-stoiciomeric oxygen content,

a multivalent material,

a multivalent transition metal,

a transition metal element capable of exhibiting multivalent states,

a mixed valent material,

mixed valent ions,

mixed valent transition metal ions,

multivalent ions,

multivalent transition metal ions,

multivalent copper,

multivalent copper ions,

mixed valent copper,

mixed valent copper ions,

a ceramic-like material in the RE-AE-TM-O system, where RE is a rare earth or near rare earth element, AE is an alkaline earth element, TM is a multivalent transition metal element having at least two valence states in said ceramic-like material, and O is oxygen wherein the ratio of the amounts of said transition metal in said two valence states being determined by the ratio RE: AE,

a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 1:1,

a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 2:1

a structure comprising a distorted octahedral oxygen environment,

a distorted orthorhombic crystalline structure,

an alkaline earth element substituted for at least one atom of said rare earth, rare earth-like element or rare earth characteristic in said material

a transition metal oxide,

a mixed transition metal oxide,

a copper oxide,

a mixed oxide,

a mixed oxide with alkaline earth doping,

a substituted transition metal oxide,

a mixed oxide with alkaline earth-like doping,

a copper oxide wherein said alkaline earth or alkaline earth element is atomically large with respect to copper,

a copper oxide doped with an alkaline earth element, alkaline earth like element, or an element with an alkaline earth characteristic where the concentration of said alkaline earth element, alkaline earth like element, or said element with an alkaline earth characteristic is near to the concentration of said alkaline earth element , alkaline earth like element or said element with an alkaline earth characteristic where the superconducting copper oxide phase in said material undergoes an orthorhombic to tetragonal structural phase transition,

a mixed copper oxide doped with an element chosen to result in Cu^{3+} ions in said material,

a doped transition metal oxide,

a copper oxide wherein at least one other element is an element which results in Cu^{3+} ions in said material,

a copper oxide wherein at least one other element is an element chosen to result in the presence of both Cu^{2+} and Cu^{3+} ions,

a substituted copper oxide exhibiting mixed valence states,

a superconductor being comprised of at least four elements, none of which is itself superconducting at a temperature greater than or equal to 26°K,

at least four elements, none of which is itself a superconductor,

a superconductor being comprised of said transition element which itself is not superconducting,

a superconductor being an oxide having multivalent oxidation states,

a transition metal oxide having substitutions therein, the amount of said substitutions being sufficient to produce sufficient electron-phonon interactions in said material that said material exhibits said superconductivity,

a crystalline mixed valent oxide having a layer-like structure,

at least one element in a nonstoichiometric atomic proportion,

a composition of the formula $Ba_xLa_{x-5}Cu_5O_Y$ wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition of the formula $BaLa_{5-x}Cu_5O_{5(3-y)}$, wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition wherein at least one element is in a nonstoichiometric atomic proportion;

a composition comprising a metallic, oxygen-deficient, perovskite-like, mixed valent transition metal compound, and

combinations thereof.

CLAIM 570 (New) A structure according to claim 562 wherein said material comprises at least one phase which comprises a property selected from the group consisting of:

a layered structure,

a layered crystalline structure,

a substantially layered structure,

a substantially layered crystalline structure,

a layered-like structure,

a layered-type structure,

a layered characteristic,

a layered perovskite structure,

a layered perovskite crystal structure,

a substantially layered perovskite structure,

a substantially layered perovskite crystal structure,

a perovskite structure,

a substantially perovskite structure,

a perovskite-like structure,

a perovskite type structure,

a structure comprising a perovskite characteristic,

a perovskite related structure,

a crystalline structure,

a layer-like crystalline structure,

a structure which is structurally substantially similar to an orthorhombic-tetragonal phase of said material,

a crystalline structure which enhances electron-phonon interactions to produce superconductivity,

a structure enhancing the number of Jahn-Teller polarons in said material,

a distorted crystalline structure characterized by an oxygen deficiency,

a structure comprising enhanced polaron formation,

a ceramic material,

a ceramic-like material,

a ceramic characteristic,

a ceramic type material,

a stoiciomeric oxygen content,

a non-stoiciomeric oxygen content,

a multivalent material,

a multivalent transition metal,

a transition metal element capable of exhibiting multivalent states,

a mixed valent material,

mixed valent ions,

mixed valent transition metal ions,

multivalent ions,

multivalent transition metal ions,

multivalent copper,

multivalent copper ions,

mixed valent copper,

mixed valent copper ions,

a ceramic-like material in the RE-AE-TM-O system, where RE is a rare earth or near rare earth element, AE is an alkaline earth element, TM is a multivalent transition metal element having at least two valence states in said ceramic-like

material, and O is oxygen wherein the ratio of the amounts of said transition metal in said two valence states being determined by the ratio RE: AE,

a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 1:1,

a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 2:1

a structure comprising a distorted octahedral oxygen environment,

a distorted orthorhombic crystalline structure,

an alkaline earth element substituted for at least one atom of said rare earth, rare earth-like element or rare earth characteristic in said material

a transition metal oxide,

a mixed transition metal oxide,

a copper oxide,

a mixed oxide,

a mixed oxide with alkaline earth doping,

a substituted transition metal oxide,

a mixed oxide with alkaline earth-like doping,

a copper oxide wherein said alkaline earth or alkaline earth element is atomically large with respect to copper,
a copper oxide doped with an alkaline earth element, alkaline earth like element, or an element with an alkaline earth characteristic where the concentration of said alkaline earth element, alkaline earth like element, or said element with an alkaline earth characteristic is near to the concentration of said alkaline earth element , alkaline earth like element or said element with an alkaline earth characteristic where the superconducting copper oxide phase in said material undergoes an orthorhombic to tetragonal structural phase transition,

a mixed copper oxide doped with an element chosen to result in Cu^{3+} ions in said material,

a doped transition metal oxide,

a copper oxide wherein at least one other element is an element which results in Cu^{3+} ions in said material,

a copper oxide wherein at least one other element is an element chosen to result in the presence of both Cu^{2+} and Cu^{3+} ions,

a substituted copper oxide exhibiting mixed valence states,

a superconductor being comprised of at least four elements, none of which is itself superconducting at a temperature greater than or equal to 26°K,

at least four elements, none of which is itself a superconductor,

a superconductor being comprised of said transition element which itself is not superconducting,

a superconductor being an oxide having multivalent oxidation states,
a transition metal oxide having substitutions therein, the amount of said substitutions being sufficient to produce sufficient electron-phonon interactions in said material that said material exhibits said superconductivity,

a crystalline mixed valent oxide having a layer-like structure,

at least one element in a nonstoichiometric atomic proportion,

a composition of the formula $Ba_xLa_{x-5}Cu_5O_Y$ wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition of the formula $BaLa_{5-x}Cu_5O_{5(3-y)}$, wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition wherein at least one element is in a nonstoichiometric atomic proportion;

a composition comprising a metallic, oxygen-deficient, perovskite-like, mixed valent transition metal compound, and

combinations thereof.

CLAIM 571 (New) A structure according to claim 563 wherein said material comprises at least one phase which comprises a property selected from the group consisting of:

a layered structure,

a layered crystalline structure,

a substantially layered structure,

a substantially layered crystalline structure,

a layered-like structure,

a layered-type structure,

a layered characteristic,

a layered perovskite structure,

a layered perovskite crystal structure,

a substantially layered perovskite structure,

a substantially layered perovskite crystal structure,

a perovskite structure,

a substantially perovskite structure,

a perovskite-like structure,

a perovskite type structure,

a structure comprising a perovskite characteristic,

a perovskite related structure,

a crystalline structure,

a layer-like crystalline structure,

a structure which is structurally substantially similar to an orthorhombic-tetragonal phase of said material,

a crystalline structure which enhances electron-phonon interactions to produce superconductivity,

a structure enhancing the number of Jahn-Teller polarons in said material,

a distorted crystalline structure characterized by an oxygen deficiency,

a structure comprising enhanced polaron formation,

a ceramic material,

a ceramic-like material,

a ceramic characteristic,

a ceramic type material,

a stoiciomeric oxygen content,

a non-stoiciomeric oxygen content,

a multivalent material,

a multivalent transition metal,

a transition metal element capable of exhibiting multivalent states,

a mixed valent material,

mixed valent ions,

mixed valent transition metal ions,

multivalent ions,

multivalent transition metal ions,

multivalent copper,

multivalent copper ions,

mixed valent copper,

mixed valent copper ions,

a ceramic-like material in the RE-AE-TM-O system, where RE is a rare earth or near rare earth element, AE is an alkaline earth element, TM is a multivalent transition metal element having at least two valence states in said ceramic-like material, and O is oxygen wherein the ratio of the amounts of said transition metal in said two valence states being determined by the ratio RE: AE,

a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 1:1,

a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 2:1

a structure comprising a distorted octahedral oxygen environment,

a distorted orthorhombic crystalline structure,

an alkaline earth element substituted for at least one atom of said rare earth, rare earth-like element or rare earth characteristic in said material

a transition metal oxide,

a mixed transition metal oxide,

a copper oxide,

a mixed oxide,

a mixed oxide with alkaline earth doping,

a substituted transition metal oxide,

a mixed oxide with alkaline earth-like doping,

a copper oxide wherein said alkaline earth or alkaline earth element is atomically large with respect to copper,

a copper oxide doped with an alkaline earth element, alkaline earth like element, or an element with an alkaline earth characteristic where the concentration of said alkaline earth element, alkaline earth like element, or said element with an alkaline earth characteristic is near to the concentration of said alkaline earth element , alkaline earth like element or said element with an alkaline earth characteristic where the superconducting copper oxide phase in said material undergoes an orthorhombic to tetragonal structural phase transition,

a mixed copper oxide doped with an element chosen to result in Cu^{3+} ions in said material,

a doped transition metal oxide,

a copper oxide wherein at least one other element is an element which results in Cu^{3+} ions in said material,

a copper oxide wherein at least one other element is an element chosen to result in the presence of both Cu^{2+} and Cu^{3+} ions,

a substituted copper oxide exhibiting mixed valence states,

a superconductor being comprised of at least four elements, none of which is itself superconducting at a temperature greater than or equal to 26°K,

at least four elements, none of which is itself a superconductor,

a superconductor being comprised of said transition element which itself is not superconducting,

a superconductor being an oxide having multivalent oxidation states,
a transition metal oxide having substitutions therein, the amount of said substitutions being sufficient to produce sufficient electron-phonon interactions in said material that said material exhibits said superconductivity,

a crystalline mixed valent oxide having a layer-like structure,

at least one element in a nonstoichiometric atomic proportion,

a composition of the formula $Ba_xLa_{x-5}Cu_5O_Y$ wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition of the formula $BaLa_{5-x}Cu_5O_{5(3-y)}$, wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition wherein at least one element is in a nonstoichiometric atomic proportion;

a composition comprising a metallic, oxygen-deficient, perovskite-like, mixed valent transition metal compound, and

combinations thereof.

CLAIM 572 (New) A structure according to claim 564 wherein said material comprises at least one phase which comprises a property selected from the group consisting of:

a layered structure,

a layered crystalline structure,

a substantially layered structure,

a substantially layered crystalline structure,

a layered-like structure,

a layered-type structure,

a layered characteristic,

a layered perovskite structure,

a layered perovskite crystal structure,

a substantially layered perovskite structure,

a substantially layered perovskite crystal structure,

a perovskite structure,

a substantially perovskite structure,

a perovskite-like structure,

a perovskite type structure,

a structure comprising a perovskite characteristic,

a perovskite related structure,

a crystalline structure,

a layer-like crystalline structure,

a structure which is structurally substantially similar to an orthorhombic-tetragonal phase of said material,

a crystalline structure which enhances electron-phonon interactions to produce superconductivity,

a structure enhancing the number of Jahn-Teller polarons in said material,

a distorted crystalline structure characterized by an oxygen deficiency,

a structure comprising enhanced polaron formation,

a ceramic material,

a ceramic-like material,

a ceramic characteristic,

a ceramic type material,

a stoiciomeric oxygen content,

a non-stoiciomeric oxygen content,

a multivalent material,

a multivalent transition metal,

a transition metal element capable of exhibiting multivalent states,

a mixed valent material,

mixed valent ions,

mixed valent transition metal ions,

multivalent ions,

multivalent transition metal ions,

multivalent copper,

multivalent copper ions,

mixed valent copper,

mixed valent copper ions,

a ceramic-like material in the RE-AE-TM-O system, where RE is a rare earth or near rare earth element, AE is an alkaline earth element, TM is a multivalent transition metal element having at least two valence states in said ceramic-like

material, and O is oxygen wherein the ratio of the amounts of said transition metal in said two valence states being determined by the ratio RE: AE,

a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 1:1,

a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 2:1

a structure comprising a distorted octahedral oxygen environment,

a distorted orthorhombic crystalline structure,

an alkaline earth element substituted for at least one atom of said rare earth, rare earth-like element or rare earth characteristic in said material

a transition metal oxide,

a mixed transition metal oxide,

a copper oxide,

a mixed oxide,

a mixed oxide with alkaline earth doping,

a substituted transition metal oxide,

a mixed oxide with alkaline earth-like doping,

a copper oxide wherein said alkaline earth or alkaline earth element is atomically large with respect to copper,

a copper oxide doped with an alkaline earth element, alkaline earth like element, or an element with an alkaline earth characteristic where the concentration of said alkaline earth element, alkaline earth like element, or said element with an alkaline earth characteristic is near to the concentration of said alkaline earth element , alkaline earth like element or said element with an alkaline earth characteristic where the superconducting copper oxide phase in said material undergoes an orthorhombic to tetragonal structural phase transition,

a mixed copper oxide doped with an element chosen to result in Cu^{3+} ions in said material,

a doped transition metal oxide,

a copper oxide wherein at least one other element is an element which results in Cu^{3+} ions in said material,

a copper oxide wherein at least one other element is an element chosen to result in the presence of both Cu^{2+} and Cu^{3+} ions,

a substituted copper oxide exhibiting mixed valence states,

a superconductor being comprised of at least four elements, none of which is itself superconducting at a temperature greater than or equal to 26°K,

at least four elements, none of which is itself a superconductor,

a superconductor being comprised of said transition element which itself is not superconducting,

a superconductor being an oxide having multivalent oxidation states,

a transition metal oxide having substitutions therein, the amount of said substitutions being sufficient to produce sufficient electron-phonon interactions in said material that said material exhibits said superconductivity,

a crystalline mixed valent oxide having a layer-like structure,

at least one element in a nonstoichiometric atomic proportion,

a composition of the formula $Ba_xLa_{x-5}Cu_5O_Y$ wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition of the formula $BaLa_{5-x}Cu_5O_{5(3-y)}$, wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition wherein at least one element is in a nonstoichiometric atomic proportion;

a composition comprising a metallic, oxygen-deficient, perovskite-like, mixed valent transition metal compound, and

combinations thereof.

CLAIM 573 (New) A structure according to claim 565 wherein said material comprises at least one phase which comprises a property selected from the group consisting of:

a layered structure,

a layered crystalline structure,

a substantially layered structure,

a substantially layered crystalline structure,

a layered-like structure,

a layered-type structure,

a layered characteristic,

a layered perovskite structure,

a layered perovskite crystal structure,

a substantially layered perovskite structure,

a substantially layered perovskite crystal structure,

a perovskite structure,

a substantially perovskite structure,

a perovskite-like structure,

a perovskite type structure,

a structure comprising a perovskite characteristic,

a perovskite related structure,

a crystalline structure,

a layer-like crystalline structure,

a structure which is structurally substantially similar to an orthorhombic-tetragonal phase of said material,

a crystalline structure which enhances electron-phonon interactions to produce superconductivity,

a structure enhancing the number of Jahn-Teller polarons in said material,

a distorted crystalline structure characterized by an oxygen deficiency,

a structure comprising enhanced polaron formation,

a ceramic material,

a ceramic-like material,

a ceramic characteristic,

a ceramic type material,

a stoiciomeric oxygen content,

a non-stoiciomeric oxygen content,

a multivalent material,

a multivalent transition metal,

a transition metal element capable of exhibiting multivalent states,

a mixed valent material,

mixed valent ions,

mixed valent transition metal ions,

multivalent ions,

multivalent transition metal ions,

multivalent copper,

multivalent copper ions,

mixed valent copper,

mixed valent copper ions,

a ceramic-like material in the RE-AE-TM-O system, where RE is a rare earth or near rare earth element, AE is an alkaline earth element, TM is a multivalent transition metal element having at least two valence states in said ceramic-like material, and O is oxygen wherein the ratio of the amounts of said transition metal in said two valence states being determined by the ratio RE: AE,

a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 1:1,

a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 2:1

a structure comprising a distorted octahedral oxygen environment,

a distorted orthorhombic crystalline structure,

an alkaline earth element substituted for at least one atom of said rare earth, rare earth-like element or rare earth characteristic in said material

a transition metal oxide,

a mixed transition metal oxide,

a copper oxide,

a mixed oxide,

a mixed oxide with alkaline earth doping,

a substituted transition metal oxide,

a mixed oxide with alkaline earth-like doping,

a copper oxide wherein said alkaline earth or alkaline earth element is atomically large with respect to copper,

a copper oxide doped with an alkaline earth element, alkaline earth like element, or an element with an alkaline earth characteristic where the concentration of said alkaline earth element, alkaline earth like element, or said element with an alkaline earth characteristic is near to the concentration of said alkaline earth element , alkaline earth like element or said element with an alkaline earth characteristic where the superconducting copper oxide phase in said material undergoes an orthorhombic to tetragonal structural phase transition,

a mixed copper oxide doped with an element chosen to result in Cu^{3+} ions in said material,

a doped transition metal oxide,

a copper oxide wherein at least one other element is an element which results in Cu^{3+} ions in said material,

a copper oxide wherein at least one other element is an element chosen to result in the presence of both Cu^{2+} and Cu^{3+} ions,

a substituted copper oxide exhibiting mixed valence states,

a superconductor being comprised of at least four elements, none of which is itself superconducting at a temperature greater than or equal to 26°K,

at least four elements, none of which is itself a superconductor,

a superconductor being comprised of said transition element which itself is not superconducting,

a superconductor being an oxide having multivalent oxidation states,
a transition metal oxide having substitutions therein, the amount of said substitutions being sufficient to produce sufficient electron-phonon interactions in said material that said material exhibits said superconductivity,

a crystalline mixed valent oxide having a layer-like structure,

at least one element in a nonstoichiometric atomic proportion,

a composition of the formula $Ba_xLa_{x-5}Cu_5O_Y$ wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition of the formula $BaLa_{5-x}Cu_5O_{5(3-y)}$, wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition wherein at least one element is in a nonstoichiometric atomic proportion;

a composition comprising a metallic, oxygen-deficient, perovskite-like, mixed valent transition metal compound, and

combinations thereof.

CLAIM 574 (New) A structure according to claim 566 wherein said material comprises at least one phase which comprises a property selected from the group consisting of:

a layered structure,

a layered crystalline structure,

a substantially layered structure,

a substantially layered crystalline structure,

a layered-like structure,

a layered-type structure,

a layered characteristic,

a layered perovskite structure,

a layered perovskite crystal structure,

a substantially layered perovskite structure,

a substantially layered perovskite crystal structure,

a perovskite structure,

a substantially perovskite structure,

a perovskite-like structure,

a perovskite type structure,

a structure comprising a perovskite characteristic,

a perovskite related structure,

a crystalline structure,

a layer-like crystalline structure,

a structure which is structurally substantially similar to an orthorhombic-tetragonal phase of said material,

a crystalline structure which enhances electron-phonon interactions to produce superconductivity,

a structure enhancing the number of Jahn-Teller polarons in said material,

a distorted crystalline structure characterized by an oxygen deficiency,

a structure comprising enhanced polaron formation,

a ceramic material,

a ceramic-like material,

a ceramic characteristic,

a ceramic type material,

a stoiciomeric oxygen content,

a non-stoiciomeric oxygen content,

a multivalent material,

a multivalent transition metal,

a transition metal element capable of exhibiting multivalent states,

a mixed valent material,

mixed valent ions,

mixed valent transition metal ions,

multivalent ions,

multivalent transition metal ions,

multivalent copper,

multivalent copper ions,

mixed valent copper,

mixed valent copper ions,

a ceramic-like material in the RE-AE-TM-O system, where RE is a rare earth or near rare earth element, AE is an alkaline earth element, TM is a multivalent transition metal element having at least two valence states in said ceramic-like material, and O is oxygen wherein the ratio of the amounts of said transition metal in said two valence states being determined by the ratio RE: AE,
a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 1:1,

a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 2:1

a structure comprising a distorted octahedral oxygen environment,

a distorted orthorhombic crystalline structure,

an alkaline earth element substituted for at least one atom of said rare earth, rare earth-like element or rare earth characteristic in said material

a transition metal oxide,

a mixed transition metal oxide,

a copper oxide,

a mixed oxide,

a mixed oxide with alkaline earth doping,

a substituted transition metal oxide,

a mixed oxide with alkaline earth-like doping,

a copper oxide wherein said alkaline earth or alkaline earth element is atomically large with respect to copper,

a copper oxide doped with an alkaline earth element, alkaline earth like element, or an element with an alkaline earth characteristic where the concentration of said alkaline earth element, alkaline earth like element, or said element with an alkaline earth characteristic is near to the concentration of said alkaline earth element , alkaline earth like element or said element with an alkaline earth characteristic where the superconducting copper oxide phase in said material undergoes an orthorhombic to tetragonal structural phase transition,

a mixed copper oxide doped with an element chosen to result in Cu^{3+} ions in said material,

a doped transition metal oxide,

a copper oxide wherein at least one other element is an element which results in Cu^{3+} ions in said material,

a copper oxide wherein at least one other element is an element chosen to result in the presence of both Cu^{2+} and Cu^{3+} ions,

a substituted copper oxide exhibiting mixed valence states,

a superconductor being comprised of at least four elements, none of which is itself superconducting at a temperature greater than or equal to 26°K,

at least four elements, none of which is itself a superconductor,

a superconductor being comprised of said transition element which itself is not superconducting,

a superconductor being an oxide having multivalent oxidation states,
a transition metal oxide having substitutions therein, the amount of said substitutions being sufficient to produce sufficient electron-phonon interactions in said material that said material exhibits said superconductivity,

a crystalline mixed valent oxide having a layer-like structure,

at least one element in a nonstoichiometric atomic proportion,

a composition of the formula $Ba_xLa_{x-5}Cu_5O_Y$ wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition of the formula $BaLa_{5-x}Cu_5O_{5(3-y)}$, wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition wherein at least one element is in a nonstoichiometric atomic proportion;

a composition comprising a metallic, oxygen-deficient, perovskite-like, mixed valent transition metal compound, and

combinations thereof.

CLAIM 575 (New) A structure according to claim 567 wherein said material comprises at least one phase which comprises a property selected from the group consisting of:

a layered structure,

a layered crystalline structure,

a substantially layered structure,

a substantially layered crystalline structure,

a layered-like structure,

a layered-type structure,

a layered characteristic,

a layered perovskite structure,

a layered perovskite crystal structure,

a substantially layered perovskite structure,

a substantially layered perovskite crystal structure,

a perovskite structure,

a substantially perovskite structure,

a perovskite-like structure,

a perovskite type structure,

a structure comprising a perovskite characteristic,

a perovskite related structure,

a crystalline structure,

a layer-like crystalline structure,

a structure which is structurally substantially similar to an orthorhombic-tetragonal phase of said material,

a crystalline structure which enhances electron-phonon interactions to produce superconductivity,

a structure enhancing the number of Jahn-Teller polarons in said material,

a distorted crystalline structure characterized by an oxygen deficiency,

a structure comprising enhanced polaron formation,

a ceramic material,

a ceramic-like material,

a ceramic characteristic,

a ceramic type material,

a stoiciomeric oxygen content,

a non-stoiciomeric oxygen content,

a multivalent material,

a multivalent transition metal,

a transition metal element capable of exhibiting multivalent states,

a mixed valent material,

mixed valent ions,

mixed valent transition metal ions,

multivalent ions,

multivalent transition metal ions,

multivalent copper,

multivalent copper ions,

mixed valent copper,

mixed valent copper ions,

a ceramic-like material in the RE-AE-TM-O system, where RE is a rare earth or near rare earth element, AE is an alkaline earth element, TM is a multivalent transition metal element having at least two valence states in said ceramic-like

material, and O is oxygen wherein the ratio of the amounts of said transition metal in said two valence states being determined by the ratio RE: AE,

a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 1:1,

a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 2:1

a structure comprising a distorted octahedral oxygen environment,

a distorted orthorhombic crystalline structure,

an alkaline earth element substituted for at least one atom of said rare earth, rare earth-like element or rare earth characteristic in said material

a transition metal oxide,

a mixed transition metal oxide,

a copper oxide,

a mixed oxide,

a mixed oxide with alkaline earth doping,

a substituted transition metal oxide,

a mixed oxide with alkaline earth-like doping,

a copper oxide wherein said alkaline earth or alkaline earth element is atomically large with respect to copper,

a copper oxide doped with an alkaline earth element, alkaline earth like element, or an element with an alkaline earth characteristic where the concentration of said alkaline earth element, alkaline earth like element, or said element with an alkaline earth characteristic is near to the concentration of said alkaline earth element , alkaline earth like element or said element with an alkaline earth characteristic where the superconducting copper oxide phase in said material undergoes an orthorhombic to tetragonal structural phase transition,

a mixed copper oxide doped with an element chosen to result in Cu^{3+} ions in said material,

a doped transition metal oxide,

a copper oxide wherein at least one other element is an element which results in Cu^{3+} ions in said material,

a copper oxide wherein at least one other element is an element chosen to result in the presence of both Cu^{2+} and Cu^{3+} ions,

a substituted copper oxide exhibiting mixed valence states,

a superconductor being comprised of at least four elements, none of which is itself superconducting at a temperature greater than or equal to 26°K,

at least four elements, none of which is itself a superconductor,

a superconductor being comprised of said transition element which itself is not superconducting,

a superconductor being an oxide having multivalent oxidation states,

a transition metal oxide having substitutions therein, the amount of said substitutions being sufficient to produce sufficient electron-phonon interactions in said material that said material exhibits said superconductivity,

a crystalline mixed valent oxide having a layer-like structure,

at least one element in a nonstoichiometric atomic proportion,

a composition of the formula $Ba_xLa_{x-5}Cu_5O_Y$ wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition of the formula $BaLa_{5-x}Cu_5O_{5(3-y)}$, wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition wherein at least one element is in a nonstoichiometric atomic proportion;

a composition comprising a metallic, oxygen-deficient, perovskite-like, mixed valent transition metal compound, and

combinations thereof.

CLAIM 576 (New) A structure according to claim 568 said material comprises at least one phase which comprises a property selected from the group consisting of:

a layered structure,

a layered crystalline structure,

a substantially layered structure,

a substantially layered crystalline structure,

a layered-like structure,

a layered-type structure,

a layered characteristic,

a layered perovskite structure,

a layered perovskite crystal structure,

a substantially layered perovskite structure,

a substantially layered perovskite crystal structure,

a perovskite structure,

a substantially perovskite structure,

a perovskite-like structure,

a perovskite type structure,

a structure comprising a perovskite characteristic,

a perovskite related structure,

a crystalline structure,

a layer-like crystalline structure,

a structure which is structurally substantially similar to an orthorhombic-tetragonal phase of said material,

a crystalline structure which enhances electron-phonon interactions to produce superconductivity,

a structure enhancing the number of Jahn-Teller polarons in said material,

a distorted crystalline structure characterized by an oxygen deficiency,

a structure comprising enhanced polaron formation,

a ceramic material,

a ceramic-like material,

a ceramic characteristic,

a ceramic type material,

a stoiciomeric oxygen content,

a non-stoiciomeric oxygen content,

a multivalent material,

a multivalent transition metal,

a transition metal element capable of exhibiting multivalent states,

a mixed valent material,

mixed valent ions,

mixed valent transition metal ions,

multivalent ions,

multivalent transition metal ions,

multivalent copper,

multivalent copper ions,

mixed valent copper,

mixed valent copper ions,

a ceramic-like material in the RE-AE-TM-O system, where RE is a rare earth or near rare earth element, AE is an alkaline earth element, TM is a multivalent transition metal element having at least two valence states in said ceramic-like

material, and O is oxygen wherein the ratio of the amounts of said transition metal in said two valence states being determined by the ratio RE: AE,

a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 1:1,

a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 2:1

a structure comprising a distorted octahedral oxygen environment,

a distorted orthorhombic crystalline structure,

an alkaline earth element substituted for at least one atom of said rare earth, rare earth-like element or rare earth characteristic in said material

a transition metal oxide,

a mixed transition metal oxide,

a copper oxide,

a mixed oxide,

a mixed oxide with alkaline earth doping,

a substituted transition metal oxide,

a mixed oxide with alkaline earth-like doping,

a copper oxide wherein said alkaline earth or alkaline earth element is atomically large with respect to copper,
a copper oxide doped with an alkaline earth element, alkaline earth like element, or an element with an alkaline earth characteristic where the concentration of said alkaline earth element, alkaline earth like element, or said element with an alkaline earth characteristic is near to the concentration of said alkaline earth element , alkaline earth like element or said element with an alkaline earth characteristic where the superconducting copper oxide phase in said material undergoes an orthorhombic to tetragonal structural phase transition,

a mixed copper oxide doped with an element chosen to result in Cu^{3+} ions in said material,

a doped transition metal oxide,

a copper oxide wherein at least one other element is an element which results in Cu^{3+} ions in said material,

a copper oxide wherein at least one other element is an element chosen to result in the presence of both Cu^{2+} and Cu^{3+} ions,

a substituted copper oxide exhibiting mixed valence states,

a superconductor being comprised of at least four elements, none of which is itself superconducting at a temperature greater than or equal to 26°K,

at least four elements, none of which is itself a superconductor,

a superconductor being comprised of said transition element which itself is not superconducting,

a superconductor being an oxide having multivalent oxidation states,
a transition metal oxide having substitutions therein, the amount of said substitutions being sufficient to produce sufficient electron-phonon interactions in said material that said material exhibits said superconductivity,

a crystalline mixed valent oxide having a layer-like structure,

at least one element in a nonstoichiometric atomic proportion,

a composition of the formula $Ba_xLa_{x-5}Cu_5O_Y$ wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition of the formula $BaLa_{5-x}Cu_5O_{5(3-y)}$, wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition wherein at least one element is in a nonstoichiometric atomic proportion;

a composition comprising a metallic, oxygen-deficient, perovskite-like, mixed valent transition metal compound, and

combinations thereof.

CLAIM 577 (New) A structure according to claim 561, wherein said transition metal is selected from the group consisting of copper, nickel and chromium.

CLAIM 578 (New) A structure according to claim 561 wherein said rare earth-like elements comprise a rare earth characteristic.

CLAIM 579 (New) A structure according to claim 561 wherein said composition comprises one or more of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

CLAIM 580 (New) A structure according to claim 561 wherein said composition comprises one or more of one or more of of Be, Mg, Ca, Sr, Ba and Ra and one or more of Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

CLAIM 581 (New) A structure according to claim 561 wherein said material can be made according to known principles of ceramic science.

CLAIM 582 (New) A structure according to claim 561 wherein said material comprises a metallic, oxygen-deficient, perovskite-like, mixed valent transition metal compound.

CLAIM 583 (New) A structure according to claim 561 wherein said material comprises a metallic, oxygen-deficient, perovskite-like, mixed valent copper compound.

CLAIM 584 (New) A structure according to claim 561 wherein said material comprises a multiphase material wherein at least one phase exhibits superconductivity.

CLAIM 585 (New) A structure according to claim 561 wherein said structure is selected from the group consisting of an apparatus, a device and a combination.

CLAIM 586 (New) A structure according to claim 561 wherein said material comprises at least one element selected from each of said first element group and said second element group.

CLAIM 587 (New) A structure according to any one of claims 561 to 585 or 586 wherein said structure is selected from the group consisting of:

a power generation device,
an electrical power transmission device,
an electrical power transmission element,
a coil,
a magnet,
a plasma device,
a nuclear device,
a nuclear magnetic resonace device,
a nuclear magnetic imaging device,
a magnetic levitation device,
a power gerneation system,
a thermonuclear fusion device,
a switching device,
a Josephson junction device,
an electrical packaging device,
a circuit device,
a electronic instrumentation device,
a magnetic suceptomoter, and
a magnetometer.

CLAIM 588 (New) A structure according to any one of claims 561 to 586 or 587 wherein said structure is a coil comprised of said material.

CLAIM 589 (New) A structure according to claim 588 wherein said material possesses substantially zero electrical resistance.

CLAIM 590 (New) A structure according to claim 588 wherein said coil possesses substantially zero electrical resistance.

CLAIM 591 A structure according to claim 561 where in said structure is selected from the group consisting of a device, an apparatus, a circuit and a combination.

CLAIM 592 (New) A structure according to any one of claims 561 to 590 or 591 wherein said material possesses substantially zero electrical resistance.

CLAIM 593 (New) A structure according to any one of claims 561 to 586 or 587 wherein said circuit element has an input capable of receiving an input current and an output capable of outputting an output current through substantially zero electrical resistance. between said input and said output.

CLAIM 594 (New) A structure according to claim 593 wherein said material possesses substantially zero electrical resistance.

CLAIM 595 (New) A structure according to any one of claims 561 to 586 or 587 wherein said circuit element has an input capable of receiving an input current and an output capable of outputting an output through substantially zero electrical resistance. between said input and said output.

CLAIM 596 (New) A structure according to claim 595 wherein said material possesses substantially zero electrical resistance.

CLAIM 597 (New) A structure according to any one of claims 561 to 590 or 591 wherein said structure is designed for said circuit element to be capable of carrying said superconducting current.

CLAIM 598 (New) A structure according to claim 597 wherein said material possesses substantially zero electrical resistance.

CLAIM 599 (New) A structure according to claim 593 wherein said structure is designed for said circuit element to be capable of carrying said superconducting current.

CLAIM 600 (New) A structure according to claim 599 wherein said material possesses substantially zero electrical resistance.

CLAIM 601 (New) A structure according to claim 595 wherein said structure is designed for said circuit element to be capable of carrying said superconducting current.

CLAIM 602 (New) A structure according to claim 601 wherein said material possesses substantially zero electrical resistance.

CLAIM 603 (New) A structure according to any one of claims 561 to 586 or 587 wherein said circuit element is capable of carrying a superconducting current flowing therein through substantially zero electrical resistance.

CLAIM 604 (New) A structure according to claim 603 wherein said material possesses substantially zero electrical resistance.

CLAIM 605 (New) A structure comprising:

a circuit comprising a circuit element comprising a material comprising a T_c greater than or equal to 26°K, said material exhibiting *a* substantially zero resistance to the flow of electrical current therethrough when in a superconducting state;

said material comprises a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof;

said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements, and

said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 606 (New) An structure according to claim 605 further including a temperature controller capable of maintaining said material at a temperature less than or equal to said to said T_C.

CLAIM 607 (New) A structure according to claim 605 further including a current source capable of providing said superconducting current.

CLAIM 608 (New) A structure according to claim 606 further including a current source capable of providing said superconducting current.

CLAIM 609 (New) A structure according to claim 605 wherein said material is capable of being at a temperature less than or equal to said T_C and greater than or equal to 26°K.

CLAIM 610 (New) A structure according to claim 602 wherein said material is capable of being at a temperature less than or equal to said T_C and greater than or equal to 26°K.

CLAIM 611 (New) A structure according to claim 607 wherein said material is capable of being at a temperature less than or equal to said T_C and greater than or equal to 26°K.

CLAIM 612 (New) A structure according to claim 608 wherein said material is capable of being at a temperature less than equal to said T_C and greater than or equal to 26°K.

CLAIM 613 (New) A structure according to claim 605 wherein said material comprises at least one phase which comprises a property selected from the group consisting of:

a layered structure,

a layered crystalline structure,

a substantially layered structure,

a substantially layered crystalline structure,

a layered-like structure,

a layered-type structure,

a layered characteristic,

a layered perovskite structure,

a layered perovskite crystal structure,

a substantially layered perovskite structure,

a substantially layered perovskite crystal structure,

a perovskite structure,

a substantially perovskite structure,

a perovskite-like structure,

a perovskite type structure,

a structure comprising a perovskite characteristic,

a perovskite related structure,

a crystalline structure,

a layer-like crystalline structure,

a structure which is structurally substantially similar to an orthorhombic-tetragonal phase of said material,

a crystalline structure which enhances electron-phonon interactions to produce superconductivity,

a structure enhancing the number of Jahn-Teller polarons in said material,

a distorted crystalline structure characterized by an oxygen deficiency,

a structure comprising enhanced polaron formation,

a ceramic material,

a ceramic-like material,

a ceramic characteristic,

a ceramic type material,

a stoiciomeric oxygen content,

a non-stoiciomeric oxygen content,

a multivalent material,

a multivalent transition metal,

a transition metal element capable of exhibiting multivalent states,

a mixed valent material,

mixed valent ions,

mixed valent transition metal ions,

multivalent ions,

multivalent transition metal ions,

multivalent copper,

multivalent copper ions,

mixed valent copper,

mixed valent copper ions,

a ceramic-like material in the RE-AE-TM-O system, where RE is a rare earth or near rare earth element, AE is an alkaline earth element, TM is a multivalent transition metal element having at least two valence states in said ceramic-like material, and O is oxygen wherein the ratio of the amounts of said transition metal in said two valence states being determined by the ratio RE: AE,

a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 1:1,

a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 2:1

a structure comprising a distorted octahedral oxygen environment,

a distorted orthorhombic crystalline structure,

an alkaline earth element substituted for at least one atom of said rare earth, rare earth-like element or rare earth characteristic in said material

a transition metal oxide,

a mixed transition metal oxide,

a copper oxide,

a mixed oxide,

a mixed oxide with alkaline earth doping,

a substituted transition metal oxide,

a mixed oxide with alkaline earth-like doping,

a copper oxide wherein said alkaline earth or alkaline earth element is atomically large with respect to copper,

a copper oxide doped with an alkaline earth element, alkaline earth like element, or an element with an alkaline earth characteristic where the concentration of said alkaline earth element, alkaline earth like element, or said element with an alkaline earth characteristic is near to the concentration of said alkaline earth element , alkaline earth like element or said element with an alkaline earth characteristic where the superconducting copper oxide phase in said material undergoes an orthorhombic to tetragonal structural phase transition,

a mixed copper oxide doped with an element chosen to result in Cu^{3+} ions in said material,

a doped transition metal oxide,

a copper oxide wherein at least one other element is an element which results in Cu^{3+} ions in said material,

a copper oxide wherein at least one other element is an element chosen to result in the presence of both Cu^{2+} and Cu^{3+} ions,

a substituted copper oxide exhibiting mixed valence states,

a superconductor being comprised of at least four elements, none of which is itself superconducting at a temperature greater than or equal to 26°K,

at least four elements, none of which is itself a superconductor,

a superconductor being comprised of said transition element which itself is not superconducting,

a superconductor being an oxide having multivalent oxidation states,

a transition metal oxide having substitutions therein, the amount of said substitutions being sufficient to produce sufficient electron-phonon interactions in said material that said material exhibits said superconductivity,

a crystalline mixed valent oxide having a layer-like structure,

at least one element in a nonstoichiometric atomic proportion,

a composition of the formula $Ba_xLa_{x-5}Cu_5O_Y$ wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition of the formula $BaLa_{5-x}Cu_5O_{5(3-y)}$, wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide

phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition wherein at least one element is in a nonstoichiometric atomic proportion;

a composition comprising a metallic, oxygen-deficient, perovskite-like, mixed valent transition metal compound, and

combinations thereof.

CLAIM 614 (New) A structure according to claim 606 wherein said material comprises at least one phase which comprises a property selected from the group consisting of:

a layered structure,

a layered crystalline structure,

a substantially layered structure,

a substantially layered crystalline structure,

a layered-like structure,

a layered-type structure,

a layered characteristic,

a layered perovskite structure,

a layered perovskite crystal structure,

a substantially layered perovskite structure,

a substantially layered perovskite crystal structure,

a perovskite structure,

a substantially perovskite structure,

a perovskite-like structure,

a perovskite type structure,

a structure comprising a perovskite characteristic,

a perovskite related structure,

a crystalline structure,

a layer-like crystalline structure,

a structure which is structurally substantially similar to an orthorhombic-tetragonal phase of said material,

a crystalline structure which enhances electron-phonon interactions to produce superconductivity,

a structure enhancing the number of Jahn-Teller polarons in said material,

a distorted crystalline structure characterized by an oxygen deficiency,

a structure comprising enhanced polaron formation,

a ceramic material,

a ceramic-like material,

a ceramic characteristic,

a ceramic type material,

a stoiciomeric oxygen content,

a non-stoiciomeric oxygen content,

a multivalent material,

a multivalent transition metal,

a transition metal element capable of exhibiting multivalent states,

a mixed valent material,

mixed valent ions,

mixed valent transition metal ions,

multivalent ions,

multivalent transition metal ions,

multivalent copper,

multivalent copper ions,

mixed valent copper,

mixed valent copper ions,

a ceramic-like material in the RE-AE-TM-O system, where RE is a rare earth or near rare earth element, AE is an alkaline earth element, TM is a multivalent transition metal element having at least two valence states in said ceramic-like

material, and O is oxygen wherein the ratio of the amounts of said transition metal in said two valence states being determined by the ratio RE: AE,

a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 1:1,

a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 2:1

a structure comprising a distorted octahedral oxygen environment,

a distorted orthorhombic crystalline structure,

an alkaline earth element substituted for at least one atom of said rare earth, rare earth-like element or rare earth characteristic in said material

a transition metal oxide,

a mixed transition metal oxide,

a copper oxide,

a mixed oxide,

a mixed oxide with alkaline earth doping,

a substituted transition metal oxide,

a mixed oxide with alkaline earth-like doping,

a copper oxide wherein said alkaline earth or alkaline earth element is atomically large with respect to copper,
a copper oxide doped with an alkaline earth element, alkaline earth like element, or an element with an alkaline earth characteristic where the concentration of said alkaline earth element, alkaline earth like element, or said element with an alkaline earth characteristic is near to the concentration of said alkaline earth element , alkaline earth like element or said element with an alkaline earth characteristic where the superconducting copper oxide phase in said material undergoes an orthorhombic to tetragonal structural phase transition,

a mixed copper oxide doped with an element chosen to result in Cu^{3+} ions in said material,

a doped transition metal oxide,

a copper oxide wherein at least one other element is an element which results in Cu^{3+} ions in said material,

a copper oxide wherein at least one other element is an element chosen to result in the presence of both Cu^{2+} and Cu^{3+} ions,

a substituted copper oxide exhibiting mixed valence states,

a superconductor being comprised of at least four elements, none of which is itself superconducting at a temperature greater than or equal to 26°K,

at least four elements, none of which is itself a superconductor,

a superconductor being comprised of said transition element which itself is not superconducting,

a superconductor being an oxide having multivalent oxidation states,
a transition metal oxide having substitutions therein, the amount of said substitutions being sufficient to produce sufficient electron-phonon interactions in said material that said material exhibits said superconductivity,

a crystalline mixed valent oxide having a layer-like structure,

at least one element in a nonstoichiometric atomic proportion,

a composition of the formula $Ba_xLa_{x-5}Cu_5O_Y$ wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition of the formula $BaLa_{5-x}Cu_5O_{5(3-y)}$, wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition wherein at least one element is in a nonstoichiometric atomic proportion;

a composition comprising a metallic, oxygen-deficient, perovskite-like, mixed valent transition metal compound, and

combinations thereof.

CLAIM 615 (New) A structure according to claim 607 wherein said material comprises at least one phase which comprises a property selected from the group consisting of:

a layered structure,

a layered crystalline structure,

a substantially layered structure,

a substantially layered crystalline structure,

a layered-like structure,

a layered-type structure,

a layered characteristic,

a layered perovskite structure,

a layered perovskite crystal structure,

a substantially layered perovskite structure,

a substantially layered perovskite crystal structure,

a perovskite structure,

a substantially perovskite structure,

a perovskite-like structure,

a perovskite type structure,

a structure comprising a perovskite characteristic,

a perovskite related structure,

a crystalline structure,

a layer-like crystalline structure,

a structure which is structurally substantially similar to an orthorhombic-tetragonal phase of said material,

a crystalline structure which enhances electron-phonon interactions to produce superconductivity,

a structure enhancing the number of Jahn-Teller polarons in said material,

a distorted crystalline structure characterized by an oxygen deficiency,

a structure comprising enhanced polaron formation,

a ceramic material,

a ceramic-like material,

a ceramic characteristic,

a ceramic type material,

a stoiciomeric oxygen content,

a non-stoiciomeric oxygen content,

a multivalent material,

a multivalent transition metal,

a transition metal element capable of exhibiting multivalent states,

a mixed valent material,

mixed valent ions,

mixed valent transition metal ions,

multivalent ions,

multivalent transition metal ions,

multivalent copper,

multivalent copper ions,

mixed valent copper,

mixed valent copper ions,

a ceramic-like material in the RE-AE-TM-O system, where RE is a rare earth or near rare earth element, AE is an alkaline earth element, TM is a multivalent transition metal element having at least two valence states in said ceramic-like material, and O is oxygen wherein the ratio of the amounts of said transition metal in said two valence states being determined by the ratio RE: AE,

a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 1:1,

a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 2:1

a structure comprising a distorted octahedral oxygen environment,

a distorted orthorhombic crystalline structure,

an alkaline earth element substituted for at least one atom of said rare earth, rare earth-like element or rare earth characteristic in said material

a transition metal oxide,

a mixed transition metal oxide,

a copper oxide,

a mixed oxide,

a mixed oxide with alkaline earth doping,

a substituted transition metal oxide,

a mixed oxide with alkaline earth-like doping,

a copper oxide wherein said alkaline earth or alkaline earth element is atomically large with respect to copper,

a copper oxide doped with an alkaline earth element, alkaline earth like element, or an element with an alkaline earth characteristic where the concentration of said alkaline earth element, alkaline earth like element, or said element with an alkaline earth characteristic is near to the concentration of said alkaline earth element , alkaline earth like element or said element with an alkaline earth characteristic where the superconducting copper oxide phase in said material undergoes an orthorhombic to tetragonal structural phase transition,

a mixed copper oxide doped with an element chosen to result in Cu^{3+} ions in said material,

a doped transition metal oxide,

a copper oxide wherein at least one other element is an element which results in Cu^{3+} ions in said material,

a copper oxide wherein at least one other element is an element chosen to result in the presence of both Cu^{2+} and Cu^{3+} ions,

a substituted copper oxide exhibiting mixed valence states,

a superconductor being comprised of at least four elements, none of which is itself superconducting at a temperature greater than or equal to 26°K,

at least four elements, none of which is itself a superconductor,

a superconductor being comprised of said transition element which itself is not superconducting,

a superconductor being an oxide having multivalent oxidation states,
a transition metal oxide having substitutions therein, the amount of said substitutions being sufficient to produce sufficient electron-phonon interactions in said material that said material exhibits said superconductivity,

a crystalline mixed valent oxide having a layer-like structure,

at least one element in a nonstoichiometric atomic proportion,

a composition of the formula $Ba_xLa_{x-5}Cu_5O_Y$ wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition of the formula $BaLa_{5-x}Cu_5O_{5(3-y)}$, wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition wherein at least one element is in a nonstoichiometric atomic proportion;

a composition comprising a metallic, oxygen-deficient, perovskite-like, mixed valent transition metal compound, and

combinations thereof.

CLAIM 616 (New) A structure according to claim 698 wherein said material comprises at least one phase which comprises a property selected from the group consisting of:

a layered structure,

a layered crystalline structure,

a substantially layered structure,

a substantially layered crystalline structure,

a layered-like structure,

a layered-type structure,

a layered characteristic,

a layered perovskite structure,

a layered perovskite crystal structure,

a substantially layered perovskite structure,

a substantially layered perovskite crystal structure,

a perovskite structure,

a substantially perovskite structure,

a perovskite-like structure,

a perovskite type structure,

a structure comprising a perovskite characteristic,

a perovskite related structure,

a crystalline structure,

a layer-like crystalline structure,

a structure which is structurally substantially similar to an orthorhombic-tetragonal phase of said material,

a crystalline structure which enhances electron-phonon interactions to produce superconductivity,

a structure enhancing the number of Jahn-Teller polarons in said material,

a distorted crystalline structure characterized by an oxygen deficiency,

a structure comprising enhanced polaron formation,

a ceramic material,

a ceramic-like material,

a ceramic characteristic,

a ceramic type material,

a stoiciomeric oxygen content,

a non-stoiciomeric oxygen content,

a multivalent material,

a multivalent transition metal,

a transition metal element capable of exhibiting multivalent states,

a mixed valent material,

mixed valent ions,

mixed valent transition metal ions,

multivalent ions,

multivalent transition metal ions,

multivalent copper,

multivalent copper ions,

mixed valent copper,

mixed valent copper ions,

a ceramic-like material in the RE-AE-TM-O system, where RE is a rare earth or near rare earth element, AE is an alkaline earth element, TM is a multivalent transition metal element having at least two valence states in said ceramic-like

material, and O is oxygen wherein the ratio of the amounts of said transition metal in said two valence states being determined by the ratio RE: AE,
a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 1:1,

a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 2:1

a structure comprising a distorted octahedral oxygen environment,

a distorted orthorhombic crystalline structure,

an alkaline earth element substituted for at least one atom of said rare earth, rare earth-like element or rare earth characteristic in said material

a transition metal oxide,

a mixed transition metal oxide,

a copper oxide,

a mixed oxide,

a mixed oxide with alkaline earth doping,

a substituted transition metal oxide,

a mixed oxide with alkaline earth-like doping,

a copper oxide wherein said alkaline earth or alkaline earth element is atomically large with respect to copper,

a copper oxide doped with an alkaline earth element, alkaline earth like element, or an element with an alkaline earth characteristic where the concentration of said alkaline earth element, alkaline earth like element, or said element with an alkaline earth characteristic is near to the concentration of said alkaline earth element , alkaline earth like element or said element with an alkaline earth characteristic where the superconducting copper oxide phase in said material undergoes an orthorhombic to tetragonal structural phase transition,

a mixed copper oxide doped with an element chosen to result in Cu^{3+} ions in said material,

a doped transition metal oxide,

a copper oxide wherein at least one other element is an element which results in Cu^{3+} ions in said material,

a copper oxide wherein at least one other element is an element chosen to result in the presence of both Cu^{2+} and Cu^{3+} ions,

a substituted copper oxide exhibiting mixed valence states,

a superconductor being comprised of at least four elements, none of which is itself superconducting at a temperature greater than or equal to 26°K,

at least four elements, none of which is itself a superconductor,

a superconductor being comprised of said transition element which itself is not superconducting,

a superconductor being an oxide having multivalent oxidation states,

a transition metal oxide having substitutions therein, the amount of said substitutions being sufficient to produce sufficient electron-phonon interactions in said material that said material exhibits said superconductivity,

a crystalline mixed valent oxide having a layer-like structure,

at least one element in a nonstoichiometric atomic proportion,

a composition of the formula $Ba_xLa_{x-5}Cu_5O_Y$ wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition of the formula $BaLa_{5-x}Cu_5O_{5(3-y)}$, wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition wherein at least one element is in a nonstoichiometric atomic proportion;

a composition comprising a metallic, oxygen-deficient, perovskite-like, mixed valent transition metal compound, and

combinations thereof.

CLAIM 617 (New) A structure according to claim 609 wherein said material comprises at least one phase which comprises a property selected from the group consisting of:

a layered structure,

a layered crystalline structure,

a substantially layered structure,

a substantially layered crystalline structure,

a layered-like structure,

a layered-type structure,

a layered characteristic,

a layered perovskite structure,

a layered perovskite crystal structure,

a substantially layered perovskite structure,

a substantially layered perovskite crystal structure,

a perovskite structure,

a substantially perovskite structure,

a perovskite-like structure,

a perovskite type structure,

a structure comprising a perovskite characteristic,

a perovskite related structure,

a crystalline structure,

a layer-like crystalline structure,

a structure which is structurally substantially similar to an orthorhombic-tetragonal phase of said material,

a crystalline structure which enhances electron-phonon interactions to produce superconductivity,

a structure enhancing the number of Jahn-Teller polarons in said material,

a distorted crystalline structure characterized by an oxygen deficiency,

a structure comprising enhanced polaron formation,

a ceramic material,

a ceramic-like material,

a ceramic characteristic,

a ceramic type material,

a stoiciomeric oxygen content,

a non-stoiciomeric oxygen content,

a multivalent material,

a multivalent transition metal,

a transition metal element capable of exhibiting multivalent states,

a mixed valent material,

mixed valent ions,

mixed valent transition metal ions,

multivalent ions,

multivalent transition metal ions,

multivalent copper,

multivalent copper ions,

mixed valent copper,

mixed valent copper ions,

a ceramic-like material in the RE-AE-TM-O system, where RE is a rare earth or near rare earth element, AE is an alkaline earth element, TM is a multivalent transition metal element having at least two valence states in said ceramic-like material, and O is oxygen wherein the ratio of the amounts of said transition metal in said two valence states being determined by the ratio RE: AE,

a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 1:1,

a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 2:1

a structure comprising a distorted octahedral oxygen environment,

a distorted orthorhombic crystalline structure,

an alkaline earth element substituted for at least one atom of said rare earth, rare earth-like element or rare earth characteristic in said material

a transition metal oxide,

a mixed transition metal oxide,

a copper oxide,

a mixed oxide,

a mixed oxide with alkaline earth doping,

a substituted transition metal oxide,

a mixed oxide with alkaline earth-like doping,

a copper oxide wherein said alkaline earth or alkaline earth element is atomically large with respect to copper,

a copper oxide doped with an alkaline earth element, alkaline earth like element, or an element with an alkaline earth characteristic where the concentration of said alkaline earth element, alkaline earth like element, or said element with an alkaline earth characteristic is near to the concentration of said alkaline earth element , alkaline earth like element or said element with an alkaline earth characteristic where the superconducting copper oxide phase in said material undergoes an orthorhombic to tetragonal structural phase transition,

a mixed copper oxide doped with an element chosen to result in Cu^{3+} ions in said material,

a doped transition metal oxide,

a copper oxide wherein at least one other element is an element which results in Cu^{3+} ions in said material,

a copper oxide wherein at least one other element is an element chosen to result in the presence of both Cu^{2+} and Cu^{3+} ions,

a substituted copper oxide exhibiting mixed valence states,

a superconductor being comprised of at least four elements, none of which is itself superconducting at a temperature greater than or equal to 26°K,

at least four elements, none of which is itself a superconductor,

a superconductor being comprised of said transition element which itself is not superconducting,

a superconductor being an oxide having multivalent oxidation states,
a transition metal oxide having substitutions therein, the amount of said substitutions being sufficient to produce sufficient electron-phonon interactions in said material that said material exhibits said superconductivity,

a crystalline mixed valent oxide having a layer-like structure,

at least one element in a nonstoichiometric atomic proportion,

a composition of the formula $Ba_xLa_{x-5}Cu_5O_Y$ wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition of the formula $BaLa_{5-x}Cu_5O_{5(3-y)}$, wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition wherein at least one element is in a nonstoichiometric atomic proportion;

a composition comprising a metallic, oxygen-deficient, perovskite-like, mixed valent transition metal compound, and

combinations thereof.

CLAIM 618 (New) A structure according to claim 610 wherein said material comprises at least one phase which comprises a property selected from the group consisting of:

a layered structure,

a layered crystalline structure,

a substantially layered structure,

a substantially layered crystalline structure,

a layered-like structure,

a layered-type structure,

a layered characteristic,

a layered perovskite structure,

a layered perovskite crystal structure,

a substantially layered perovskite structure,

a substantially layered perovskite crystal structure,

a perovskite structure,

a substantially perovskite structure,

a perovskite-like structure,

a perovskite type structure,

a structure comprising a perovskite characteristic,

a perovskite related structure,

a crystalline structure,

a layer-like crystalline structure,

a structure which is structurally substantially similar to an orthorhombic-tetragonal phase of said material,

a crystalline structure which enhances electron-phonon interactions to produce superconductivity,

a structure enhancing the number of Jahn-Teller polarons in said material,

a distorted crystalline structure characterized by an oxygen deficiency,

a structure comprising enhanced polaron formation,

a ceramic material,

a ceramic-like material,

a ceramic characteristic,

a ceramic type material,

a stoiciomeric oxygen content,

a non-stoiciomeric oxygen content,

a multivalent material,

a multivalent transition metal,

a transition metal element capable of exhibiting multivalent states,

a mixed valent material,

mixed valent ions,

mixed valent transition metal ions,

multivalent ions,

multivalent transition metal ions,

multivalent copper,

multivalent copper ions,

mixed valent copper,

mixed valent copper ions,

a ceramic-like material in the RE-AE-TM-O system, where RE is a rare earth or near rare earth element, AE is an alkaline earth element, TM is a multivalent transition metal element having at least two valence states in said ceramic-like material, and O is oxygen wherein the ratio of the amounts of said transition metal in said two valence states being determined by the ratio RE: AE,
a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 1:1,

a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 2:1

a structure comprising a distorted octahedral oxygen environment,

a distorted orthorhombic crystalline structure,

an alkaline earth element substituted for at least one atom of said rare earth, rare earth-like element or rare earth characteristic in said material

a transition metal oxide,

a mixed transition metal oxide,

a copper oxide,

a mixed oxide,

a mixed oxide with alkaline earth doping,

a substituted transition metal oxide,

a mixed oxide with alkaline earth-like doping,

a copper oxide wherein said alkaline earth or alkaline earth element is atomically large with respect to copper,

a copper oxide doped with an alkaline earth element, alkaline earth like element, or an element with an alkaline earth characteristic where the concentration of said alkaline earth element, alkaline earth like element, or said element with an alkaline earth characteristic is near to the concentration of said alkaline earth element , alkaline earth like element or said element with an alkaline earth characteristic where the superconducting copper oxide phase in said material undergoes an orthorhombic to tetragonal structural phase transition,

a mixed copper oxide doped with an element chosen to result in Cu^{3+} ions in said material,

a doped transition metal oxide,

a copper oxide wherein at least one other element is an element which results in Cu^{3+} ions in said material,

a copper oxide wherein at least one other element is an element chosen to result in the presence of both Cu^{2+} and Cu^{3+} ions,

a substituted copper oxide exhibiting mixed valence states,

a superconductor being comprised of at least four elements, none of which is itself superconducting at a temperature greater than or equal to 26°K,

at least four elements, none of which is itself a superconductor,

a superconductor being comprised of said transition element which itself is not superconducting,

a superconductor being an oxide having multivalent oxidation states,
a transition metal oxide having substitutions therein, the amount of said substitutions being sufficient to produce sufficient electron-phonon interactions in said material that said material exhibits said superconductivity,

a crystalline mixed valent oxide having a layer-like structure,

at least one element in a nonstoichiometric atomic proportion,

a composition of the formula $Ba_xLa_{x-5}Cu_5O_Y$ wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition of the formula $BaLa_{5-x}Cu_5O_{5(3-y)}$, wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition wherein at least one element is in a nonstoichiometric atomic proportion;

a composition comprising a metallic, oxygen-deficient, perovskite-like, mixed valent transition metal compound, and

combinations thereof.

CLAIM 619 (New) A structure according to claim 611 wherein said material comprises at least one phase which comprises a property selected from the group consisting of:

a layered structure,

a layered crystalline structure,

a substantially layered structure,

a substantially layered crystalline structure,

a layered-like structure,

a layered-type structure,

a layered characteristic,

a layered perovskite structure,

a layered perovskite crystal structure,

a substantially layered perovskite structure,

a substantially layered perovskite crystal structure,

a perovskite structure,

a substantially perovskite structure,

a perovskite-like structure,

a perovskite type structure,

a structure comprising a perovskite characteristic,

a perovskite related structure,

a crystalline structure,

a layer-like crystalline structure,

a structure which is structurally substantially similar to an orthorhombic-tetragonal phase of said material,

a crystalline structure which enhances electron-phonon interactions to produce superconductivity,

a structure enhancing the number of Jahn-Teller polarons in said material,

a distorted crystalline structure characterized by an oxygen deficiency,

a structure comprising enhanced polaron formation,

a ceramic material,

a ceramic-like material,

a ceramic characteristic,

a ceramic type material,

a stoiciomeric oxygen content,

a non-stoiciomeric oxygen content,

a multivalent material,

a multivalent transition metal,

a transition metal element capable of exhibiting multivalent states,

a mixed valent material,

mixed valent ions,

mixed valent transition metal ions,

multivalent ions,

multivalent transition metal ions,

multivalent copper,

multivalent copper ions,

mixed valent copper,

mixed valent copper ions,

a ceramic-like material in the RE-AE-TM-O system, where RE is a rare earth or near rare earth element, AE is an alkaline earth element, TM is a multivalent transition metal element having at least two valence states in said ceramic-like

material, and O is oxygen wherein the ratio of the amounts of said transition metal in said two valence states being determined by the ratio RE: AE,

a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 1:1,

a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 2:1

a structure comprising a distorted octahedral oxygen environment,

a distorted orthorhombic crystalline structure,

an alkaline earth element substituted for at least one atom of said rare earth, rare earth-like element or rare earth characteristic in said material

a transition metal oxide,

a mixed transition metal oxide,

a copper oxide,

a mixed oxide,

a mixed oxide with alkaline earth doping,

a substituted transition metal oxide,

a mixed oxide with alkaline earth-like doping,

a copper oxide wherein said alkaline earth or alkaline earth element is atomically large with respect to copper,

a copper oxide doped with an alkaline earth element, alkaline earth like element, or an element with an alkaline earth characteristic where the concentration of said alkaline earth element, alkaline earth like element, or said element with an alkaline earth characteristic is near to the concentration of said alkaline earth element , alkaline earth like element or said element with an alkaline earth characteristic where the superconducting copper oxide phase in said material undergoes an orthorhombic to tetragonal structural phase transition,

a mixed copper oxide doped with an element chosen to result in Cu^{3+} ions in said material,

a doped transition metal oxide,

a copper oxide wherein at least one other element is an element which results in Cu^{3+} ions in said material,

a copper oxide wherein at least one other element is an element chosen to result in the presence of both Cu^{2+} and Cu^{3+} ions,

a substituted copper oxide exhibiting mixed valence states,

a superconductor being comprised of at least four elements, none of which is itself superconducting at a temperature greater than or equal to 26°K,

at least four elements, none of which is itself a superconductor,

a superconductor being comprised of said transition element which itself is not superconducting,

a superconductor being an oxide having multivalent oxidation states,

a transition metal oxide having substitutions therein, the amount of said substitutions being sufficient to produce sufficient electron-phonon interactions in said material that said material exhibits said superconductivity,

a crystalline mixed valent oxide having a layer-like structure,

at least one element in a nonstoichiometric atomic proportion,

a composition of the formula $Ba_xLa_{x-5}Cu_5O_Y$ wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition of the formula $BaLa_{5-x}Cu_5O_{5(3-y)}$, wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition wherein at least one element is in a nonstoichiometric atomic proportion;

a composition comprising a metallic, oxygen-deficient, perovskite-like, mixed valent transition metal compound, and

combinations thereof.

CLAIM 620 (New) A structure according to claim 618 said material comprises at least one phase which comprises a property selected from the group consisting of:

a layered structure,

a layered crystalline structure,

a substantially layered structure,

a substantially layered crystalline structure,

a layered-like structure,

a layered-type structure,

a layered characteristic,

a layered perovskite structure,

a layered perovskite crystal structure,

a substantially layered perovskite structure,

a substantially layered perovskite crystal structure,

a perovskite structure,

a substantially perovskite structure,

a perovskite-like structure,

a perovskite type structure,

a structure comprising a perovskite characteristic,

a perovskite related structure,

a crystalline structure,

a layer-like crystalline structure,

a structure which is structurally substantially similar to an orthorhombic-tetragonal phase of said material,

a crystalline structure which enhances electron-phonon interactions to produce superconductivity,

a structure enhancing the number of Jahn-Teller polarons in said material,

a distorted crystalline structure characterized by an oxygen deficiency,

a structure comprising enhanced polaron formation,

a ceramic material,

a ceramic-like material,

a ceramic characteristic,

a ceramic type material,

a stoiciomeric oxygen content,

a non-stoiciomeric oxygen content,

a multivalent material,

a multivalent transition metal,

a transition metal element capable of exhibiting multivalent states,

a mixed valent material,

mixed valent ions,

mixed valent transition metal ions,

multivalent ions,

multivalent transition metal ions,

multivalent copper,

multivalent copper ions,

mixed valent copper,

mixed valent copper ions,

a ceramic-like material in the RE-AE-TM-O system, where RE is a rare earth or near rare earth element, AE is an alkaline earth element, TM is a multivalent transition metal element having at least two valence states in said ceramic-like

material, and O is oxygen wherein the ratio of the amounts of said transition metal in said two valence states being determined by the ratio RE: AE,

a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 1:1,

a mixed copper oxide material including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE) where the ratio (AE,RE):Cu is substantially 2:1

a structure comprising a distorted octahedral oxygen environment,

a distorted orthorhombic crystalline structure,

an alkaline earth element substituted for at least one atom of said rare earth, rare earth-like element or rare earth characteristic in said material

a transition metal oxide,

a mixed transition metal oxide,

a copper oxide,

a mixed oxide,

a mixed oxide with alkaline earth doping,

a substituted transition metal oxide,

a mixed oxide with alkaline earth-like doping,

a copper oxide wherein said alkaline earth or alkaline earth element is atomically large with respect to copper,
a copper oxide doped with an alkaline earth element, alkaline earth like element, or an element with an alkaline earth characteristic where the concentration of said alkaline earth element, alkaline earth like element, or said element with an alkaline earth characteristic is near to the concentration of said alkaline earth element , alkaline earth like element or said element with an alkaline earth characteristic where the superconducting copper oxide phase in said material undergoes an orthorhombic to tetragonal structural phase transition,

a mixed copper oxide doped with an element chosen to result in Cu^{3+} ions in said material,

a doped transition metal oxide,

a copper oxide wherein at least one other element is an element which results in Cu^{3+} ions in said material,

a copper oxide wherein at least one other element is an element chosen to result in the presence of both Cu^{2+} and Cu^{3+} ions,

a substituted copper oxide exhibiting mixed valence states,

a superconductor being comprised of at least four elements, none of which is itself superconducting at a temperature greater than or equal to 26°K,

at least four elements, none of which is itself a superconductor,

a superconductor being comprised of said transition element which itself is not superconducting,

a superconductor being an oxide having multivalent oxidation states,
a transition metal oxide having substitutions therein, the amount of said substitutions being sufficient to produce sufficient electron-phonon interactions in said material that said material exhibits said superconductivity,

a crystalline mixed valent oxide having a layer-like structure,

at least one element in a nonstoichiometric atomic proportion,

a composition of the formula $Ba_xLa_{x-5}Cu_5O_Y$ wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition of the formula $BaLa_{5-x}Cu_5O_{5(3-y)}$, wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540°C to about 950°C and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,

a composition wherein at least one element is in a nonstoichiometric atomic proportion;

a composition comprising a metallic, oxygen-deficient, perovskite-like, mixed valent transition metal compound, and

combinations thereof.

CLAIM 621 (New) A structure according to claim 605, wherein said transition metal is selected from the group consisting of copper, nickel and chromium.

CLAIM 622 (New) A structure according to claim 605 wherein said rare earth-like elements comprise a rare earth characteristic

CLAIM 623 (New) A structure according to claim 605 wherein said composition comprises one or more of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

CLAIM 624 (New) A structure according to claim 605 wherein said composition comprises one or more of one or more of of Be, Mg, Ca, Sr, Ba and Ra and one or more of Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

CLAIM 625 (New) A structure according to claim 605 wherein said material can be made according to known principles of ceramic science.

CLAIM 626 (New) A structure according to claim 605 wherein said material comprises a metallic, oxygen-deficient, perovskite-like, mixed valent transition metal compound.

CLAIM 627 (New) A structure according to claim 605 wherein said material comprises a metallic, oxygen-deficient, perovskite-like, mixed valent copper compound.

CLAIM 628 (New) A structure according to claim 605 wherein said material comprises at least one phase that exhibits superconductivity.

CLAIM 629 (New) A structure according to claim 605 wherein said structure is selected from the group consisting of an apparatus, a device and a combination.

CLAIM 630 (New) A structure according to claim 605 wherein said material comprises at least one element selected from each of said first element group and said second element group.

CLAIM 631 (New) A structure according to any one of claims 605 to 629 or 630 wherein said structure is selected from the group consisting of:

a power generation device,
an electrical power transmission device,
an electrical power transmission element,
a coil,
a magnet,
a plasma device,
a nuclear device,
a nuclear magnetic resonace device,
a nuclear magnetic imaging device,
a magnetic levitation device,
a power gerneation system,
a thermonuclear fusion device,
a switching device,
a Josephson junction device,
an electrical packaging device,
a circuit,
a electronic instrumentation device,
a magnetic suceptomoter, and
a magnetometer.

CLAIM 632 (New) A structure according to any one of claims 605 to 630 or 531 wherein said structure is a coil comprised of said material.

CLAIM 633 (New) A structure according to claim 632 wherein said material possesses substantially zero electrical resistance.

CLAIM 634 (New) A structure according to claim 632 wherein said coil possesses substantially zero electrical resistance.

CLAIM 635 A structure according to claim 605 where in said structure is selected from the group consisting of a device, an apparatus, a circuit and a combination.

CLAIM 636 (New) A structure according to any one of claims 605 to 634 or 635 wherein said material possesses substantially zero electrical resistance.

CLAIM 637 (New) A structure according to any one of claims 605 to 630 or 631 wherein said circuit element has an input capable of receiving an input current and an output capable of outputting an output current through substantially zero electrical resistance. between said input and said output.

CLAIM 638 (New) A structure according to claim 637 wherein said material possesses substantially zero electrical resistance.

CLAIM 639 (New) A structure according to any one of claims 605 to 630 or 631 wherein said circuit element has an input capable of receiving an input current and an output capable of outputting an output through substantially zero electrical resistance. between said input and said output.

CLAIM 640 (New) A structure according to claim 639 wherein said material possesses substantially zero electrical resistance.

CLAIM 641 (New) A structure according to any one of claims 605 to 634 or 635 wherein said structure is designed for said circuit element to be capable of carrying said superconducting current.

CLAIM 642 (New) A structure according to claim 641 wherein said material possesses substantially zero electrical resistance.

CLAIM 643 (New) A structure according to claim 637 wherein said structure is designed for said circuit element to be capable of carrying said superconducting current.

CLAIM 644 (New) A structure according to claim 643 wherein said material possesses substantially zero electrical resistance.

CLAIM 645 (New) A structure according to claim 639 wherein said structure is designed for said circuit element to be capable of carrying said superconducting current.

CLAIM 646 (New) A structure according to claim 645 wherein said material possesses substantially zero electrical resistance.

CLAIM 647 (New) A structure according to any one of claims 605 to 630 or 631 wherein said circuit element is capable of carrying a superconducting current flowing therein through substantially zero electrical resistance.

CLAIM 648 (New) A structure according to claim 647 wherein said material possesses substantially zero electrical resistance.

CLAIM 649 (New) A structure according to claim 588 wherein said coil is capable of carriyng a_superconducting current flowing therein without a source providing for said superconducting current.

CLAIM 650 (New) A structure according to any one of claims 561 to 586 or 587 wherein said circuit element is capable of carriyng a superconducting current flowing therein without a source providing for said superconducting current.

CLAIM 651 (New) A structure according to claim 632 wherein said coil is capable of carriyng a superconducting current flowing therein without a source providing for said superconducting current when in a superconducting state.

CLAIM 652 (New) A structure according to any one of claims 605 to 630 or 631 wherein said circuit element is capable of carriyng a superconducting current flowing therein without a source providing for said superconducting current when in a superconducting state.

CLAIM 653 (New) A structure comprising:

a circuit comprising a circuit element comprising a material having a T_c greater than or equal to 26°K capable of carrying a superconducting current;

said material comprises a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof;

said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements, and

said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 654 (New) A structure comprising:

a circuit comprising a circuit element comprising a material with a T_c greater than or equal to 26°K capable of carrying a superconducting current;

said material comprises a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof;

said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements, and

said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 655 (New) A structure comprising:

a circuit comprising a circuit element comprising a material possessing a T_c greater than or equal to 26°K capable of carrying a superconducting current;

said material comprises a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof;

said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements, and

said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 656 (New) A structure comprising:

a circuit comprising a circuit element comprising a material having a T_c greater than or equal to 26°K, said material exhibiting a substantially zero resistance to the flow of electrical current therethrough when in a superconducting state;

said material comprises a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof;

said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements, and

said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 657 (New) A structure comprising:

a circuit comprising a circuit element comprising a material with a T_c greater than or equal to 26°K, said material exhibiting *a* substantially zero resistance to the flow of electrical current therethrough when in a superconducting state;

said material comprises a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof;

said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements, and

said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 658 (New) A structure comprising:

a circuit comprising a circuit element comprising a material possessing a T_c greater than or equal to 26°K, said material exhibiting *a* substantially zero resistance to the flow of electrical current therethrough when in a superconducting state;

said material comprises a transition metal, oxygen and at least one element selected from the group consisting of a first element group, a second element group and combinations thereof;

said first element group comprises rare earth elements, rare earth-like elements and Group IIIB elements, and

said second element group comprises alkaline earth elements and Group IIA elements.

CLAIM 659 A structure according to any one of claims 561, 605, 653 to 657 or 658 wherein said rare-earth like elements include elements having a rare earth characteristic.